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New Department in Detroit Plant

Under Factory Planning Engineer—Acts as Link Between Purchasing Department and Factory—All Departments Pleased with Results

BY DON F. KENNEDY*

A COMMON remark among salesmen goes something like this: "Oh, I never go near the purchasing department if I can help it. Those fellows don't know anything about my line. I get to the superintendent or the factory manager or one of the foremen, by the back-door route."

How this state of affairs has been changed at the Timken-Detroit Axle Co.'s Detroit plant, to the complete satisfaction of the salesmen, the factory management and the purchasing department, by the installation of a new position with the title of factory planning engineer, should be of interest to manufacturing plants large enough to have a purchasing department.

The "back-door salesman" is a nuisance. This is admitted even by the firms that have in some instances found it necessary to employ salesmen for this purpose only. On their side, and it must be admitted that they have in agreement with them the sales department of almost every manufacturer of technical products, it is claimed that they are compelled to resort to such tactics in order to get an intelligent hearing. The young men in the purchasing departments of any size whose duty it is to interview the large number of unknown men with unknown products coming to their door daily naturally do not always have sufficient experience to enable them to judge the value of such products or the applicability to the plant for which they are buying. It is also claimed that such young men, and it might be said, some men who are not so young, take pleasure in using the autocratic powers with which they are vested in turning down salesmen whose products, if brought to the attention of the right persons, would be seen on investigation to solve existing problems admirably. Whatever may be the merits of this contention, the belief is universal among salesmen.

On the other hand, it is said by the men of the purchasing department that they cannot have mechanical or electrical engineers to handle all the multiplicity of detail connected with their work, nor can they call in the superintendent to talk with every man who comes to their door. This is true. They also say that they cannot maintain discipline either in their department or in the factory if every man who asks is let loose to roam about the plant at will; that the purpose of the purchasing department is to do the purchasing and that they propose to do it. Which is likewise true.

The result of this situation in most plants is that many devices and methods of merit brought to the door at large cost of salesmen's salaries and expenses never get to the right man. The opportunity is lost of lowering the cost of two elements that go to make up the cost of present day existence; the article made at the plant in question, which might be lowered by installation of the saleman's product, and the selling cost of the product itself. For the cost of bringing the product to the plants that do not buy must be paid for by the ones that do.

The factory planning engineer of the Timken-Detroit Axle Co. is a man of progressive ideas, formerly master mechanic. He reports to the manufacturing manager, who in turn reports to the vice-president and general manager. He is kept informed of the general policies of the company for six months or a year in advance, as determined by the board of directors from the reports of their sales department, in conjunction with their judgment of conditions in general in their industry. Under his jurisdiction comes building layout, location of machinery, machine loads, progressive production, progressive assembly, new methods and testing of manufacturing supplies. For a staff he has several young men who are engineering school graduates, of a naturally inquiring disposition, who seize this opportunity of acquiring in a comparatively short time the valuable and varied experience which such a position affords. In view of these con-

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ditions, they are glad to start in at a moderate salary. At their disposal is a complete chemical and physical laboratory and a well equipped experimental machine shop, used until recently as a "vestibule school," of which more will be said later.

Keeping Plant in Prime Manufacturing Order

Factory planning is based on the production schedule for the various types of axles made for the coming six to twelve months. Factory space is allocated to the different departments with this schedule in view. As a result of bringing these matters for decision under one head, a considerable amount of factory trucking has been eliminated by rearranging the locations of departments. Plans are made far enough ahead so that, regardless of varying growth as changes in business come about, the general positions of the departments remain the same.

In planning machine burden, space is left for additional machinery which will be required when production reaches figures which appear probable within the near future, and the makes and types of machines are decided upon as far as possible. When the time comes for installation, it is not necessary to move any of the machines already in place. The location of shafting, pulleys and hangers is taken into account, leaving little work for the millwrights in lining up or changing the direction of line shafts and countershafts.

ORGANIZATION CHART

President
:
:
:
Vice-President and General Manager
:
:
:
Manufacturing Manager
:
:
:
Factory Planning Engineer
:
:
:
New Methods
Progressive Assembly
Progressive Production
Machine Loads
Location of Machinery
Building Layout
Testing Manufacturing Supplies

Requisitions for new machinery and machine repairs come to this department. Being in such close touch with plant conditions, a similar machine with a low temporary burden can often be moved into place while repairs are being made to the broken one without disturbing manufacturing procedure. Requests for new machines can sometimes be filled by a similar machine formerly used by some department located in an entirely different part of the plant, but now in disuse. No machinery is allowed to be moved except on a requisition from this department.

Under the heading of new methods, the department is a clearing house for the new ideas that come every day to the minds or attention of the members themselves, or the executives and other men of the company. Being expert mechanics and knowing the conditions of the factory so closely, they are in position to pass upon the feasibility of such suggestions. All ideas submitted are studied carefully, and a written report is given to the manufacturing manager, with a copy to the originator. If found not feasible, the reasons are stated. If the idea is worth carrying out, a layout is made of the jigs, fixtures and machine equipment required and given to the tool design department to put into effect.

Securing Best Adapted Manufacturing Supplies

Testing of manufacturing supplies is the end of the work that is most original. When a salesman with a new device or product starts to tell his tale to the purchasing department, he is interrupted with the statement that there is a special department under an expert mechanic whose duty it is to look into such cases. When he recovers his breath from the sudden shock of such an unheard-of statement, he usually cries "Lead me to it!" The head of the department has the time to listen to the salesman's story, and the practical experience to decide upon the merits of it. It may be that factory conditions are such that the device will not fit into their work; or they may be discontinuing or about to discontinue the process involved; or it may be that the device is just what they are looking for, or is undergoing test at that time.

Whatever the outcome, the salesman feels that he has been afforded the opportunity of presenting his case without undue haste to a man capable of judging its merits, and entirely unbiased in his judgment. His time has not been wasted, nor has a busy factory executive with a multitude of pressing problems on his mind been called away from his work at an inopportune moment, and the purchasing department is afforded that much more time to take care of the endless detail that is part of its job. In view of the statements made in the early part of this article, it may not be out place to state here that the purchasing department of the Timken-Detroit Axle Co. has long had an enviable reputation for more than ordinary fairness and ability.

While the writer was in the office of the head of the factory planning department a salesman brought in a new type of welding apparatus for which advantages were claimed over the apparatus in common use. The factory planning engineer was in position to see that there was something to be said on this score, but he also knew that due to present business conditions castings and forgings were coming through with fewer surface defects, and that the company is gradually getting away from the use of castings. There was accordingly no use in taking up any time investigating the matter, as these conditions indicate that there will shortly be little, if any, welding done in the plant.

An important part of the work is testing of the various supplies and materials purchased and used, with a view to standardizing on makes or analyses. Constant experiments are being made in substituting less expensive articles for a purpose, or getting better results from those used. Some time ago it was decided to try out different makes of drills, cutters, spot facers, etc. The purchasing department wrote to all makers they knew or could find listed, inviting them to send in for test samples of a certain size and shape which would make possible a uniform comparison. Almost every firm addressed sent in samples, which are now being tested.

Various makes of high-speed tool steels are likewise being tried out, each one under the conditions specified as best by its maker. On one brand, for instance, it is claimed that the first grind will be necessary much sooner than is usually required, but that the additional life obtained on the second and succeeding grinds make this brand, though more

costly in first price, more economical in the end. The department has time and facilities for ascertaining the truth and value of such claims. Interesting results are being obtained from forged and cast high-speed cutters. Also undergoing scrutiny are rust removers, methods of rust-proofing, paint for axles, shellac, washing and cleaning compounds, crating, belting, oils, grinding wheels and disks and file renewers—articles such as are shown grouped at the head of the article.

Investigating for Substitutes

Shellac in large quantities is used on the paper gasket between the differential cover and the axle housing. This material has been both scarce and extremely high in price. An investigation was productive of a substitute which will save the company something like $15,000 a year, and which has the added virtue of allowing the gasket to be removed without destroying it each time the differential cover is taken off. The saving in this one item alone will very nearly pay the entire cost of the department for a year.

Quantities of grinding wheel disks are used to true up brake band linings after assembly in the axle. The disks quickly gum up with the materials from which the lining is made, and they are quickly rendered useless long before the abrasive begins to wear off. All sorts of acids and solutions have been tried in an effort to dissolve the gummy substance, but without success. A few days ago an entirely different method was tried, which seems to do the trick. As these disks cost around $1.50 each, and gum up in less than two hours, the saving here will be a very tidy item. Hardening and quenching oils, carbonizing pots and compounds are being looked into. In the insignificant subject of floor cleaning compounds, it was found that one type costing about the same as others would whiten the floor in about half the time. The saving here is in janitor's labor.

Various belt cleaning compounds are on the market. Not one of the salesmen interviewed could tell just how his cleaner actually cleaned. After considerable investigation in the chemical laboratory, it was found that the black substance which accumulates on belts after long use is in reality a sort of ink, formed by the union of the tannic acid in the belt with iron oxide from the pulleys. The cleaners which whitened the belts also removed the tannic acid, and in so doing removed the chief element of strength in the leather. A method has been found which renews a belt to what appears to be its original cleanness and goodness, without removing the strength put into the belt by tanning it in the first place, and at a cost of about 18 cents per square foot.

It was found that by spending more money for stronger crates for assembled axles a large net saving was effected as the result of fewer damaged and delayed shipments, with smaller repair bills and damage claims.

Conferences are held every day or two with the purchasing department and factory manager. Written reports are submitted to the purchasing department, on which buying principles are based. Now when the purchasing agent is approached by 20 salesmen, each with the claim that his steel is as good as the other fellow's, all the purchasing agent has to do is to say that the results of their investigations allow him to buy only from certain sources, leaving him free from bias either for or against the personality of the salesmen. If practices are discovered that render it advisable not to do business with certain firms, the purchasing department has only to say that as a result of tests it is not allowed to have any dealings with such firms.

All machine tools are serially numbered. An investigation is being made of the belt load on each machine, and a standard belt type is prescribed for it. Instead of requisitions for a certain width, weight and type of belt for each machine as it requires renewal, which may or may not be the proper one for the job, requisition will be made only for a belt for machine number so and so. By consulting a chart which is now being prepared, the proper kind of belt for this machine is ascertained and furnished.

The "vestibule school" is a department that has had its greatest use during the past three or four years. It is really an experimental machine shop, furnished with representative machine tools of all the usual types. An applicant for a job claiming to be an experienced radial drill operator, for instance, is first sent to the school and given a job to do on a radial drill. If he is incompetent and only bluffing, as many have done, it is found out before he gets in the way of regular production and perhaps spoils a tool or a part, and gets regular production traffic blocked.

The factory planning department is still feeling its way, but it has shown itself of sufficient value to be considered indispensable by the management. It has not yet been extended to the Canton, Ohio, plant, or to the forge shop or power plant at Detroit. The purchasing department heads say they would dislike to have to work without its help; the factory management is pleased, and the salesmen who do business with the company are in hopes that others upon whom they are still compelled to resort to "back-door" methods will follow the lead of this company.

THE TIMKEN-DETROIT AXLE CO. HAS FOUND A SIMPLE WAY

To make sure no worthy articles brought to them get overlooked
To bridge the gap between their purchasing department and the factory
To connect salesmen successfully with the proper person in the factory organization
To find out just what they are getting for their money in the purchase of miscellaneous factory supplies
To keep incompetent applicants for skilled jobs from spoiling work and tools
To keep machine tools in repair with least disruption to production
To keep salesmen from getting to subordinate foremen over the heads of the purchasing department
To keep the good will of the salesmen while doing it.

The Trumbull Steel Co., Warren, Ohio, has contracted with the Fuller Engineering Co., Allentown, Pa., for additional machinery to complete its pulverized coal equipment in which will be incorporated Fuller Dreadnaught gear-driven mills and indirect pulverized coal-fired Fuller driers, also pulverized coal bins, feeders, and necessary equipment for all of the sheet, pair, annealing and slab furnaces. It is planned to have several of the sheet mill furnaces in operation by Jan. 1, and the remainder several months later.

The Inland Steel Co., Chicago, at its quarterly meeting, held Oct. 26, declared the usual quarterly dividend of 75c. per share, payable Dec. 1 to stockholders of record on Nov. 10. Inland Steel Co. stock is now on the basis of $25 per share, making the rate of return 12 per cent per annum.

CAPITAL PUT INTO GERMANY

Financing of Industry by American Interests—Germany Offers Hoops and Bands

BRUSSELS, BELGIUM, Oct. 20.—Although reports on the amount of American capital invested in German industry conflict, it is probably between 16,000,000 and 20,000,000 marks. Otto Werdels, director of the Berlin Chamber of Commerce, estimates American investments at about 20,000,000 marks, while Herr Werner Wintermantel, director of American business of the Deutsche Bank, does not believe they exceed 16,000,000 marks. There are no available data that include all American financial interests in Germany, but among the better known are the holdings of the Virginia-Carolina Chemical Co. and the International Agricultural Chemical Co. in the Einickeit and Sollstedt companies. Through Kuhn, Loeb & Co. and the Guggenheim interests financial connections have been made between such American firms as the Continental Rubber Co. and the Gutta Percha Co. and the German companies of Siemens & Halske and the Stettin Electric Works.

The recent wave of national economy that has swept over Belgium has been effective in restraining many manufacturers from erecting new plants and increasing the capacities of old ones, and to a great extent this slackening in industrial expansion is noticeable in France and Holland. Reports of the recent increase in immigration into the United States are viewed by many business men as the forerunner of improved industrial conditions in America and a corresponding weakening of European industry.

Coal and coke prices continue to increase and demand exceeds the supply, partly because of the unsatisfactory functioning of the co-operative committee charged with allotting coal of the German indemnity and partly attributed to the decreased production by the miners. Statistics show that the per capita production of the Belgian miners has dropped from 222 tons in 1901 to 185 tons in 1918, and it is claimed that 1920 production is proportionately less. The union of miners is strong, out of about 150,000 mine workers, fully 130,000 being union men. Dues of a franc a week are paid by members and a strike fund of 5,000,000 francs is said to be available.

Some Evidence of Price Stability

Iron and steel prices begin to show some evidence of stability, for although producers will shade the prevailing quotations when opportunity is seen for a satisfactory tonnage, a large number of sales are being made at quoted prices. German makers are offering hoops and bands from Duisborg and Ruhrort, evidently because of conditions in Russia, which was formerly a large market for this material with both Germany and Belgium. While British interests are making a strong effort to keep Belgian producers from selling directly into foreign markets, the Belgians feel that they have attained some export success in building up business with British companies and at least temporarily eliminating American competition in the English market.

The recent strike of workers at the Ougrée-Marihaye plant has been settled. The plants in the Meuse district have been awarded about 3,000,000 francs as partial payment of their portion of the German indemnity. It is reported that the Societé National des Chemins de Fer will shortly issue heavy inquiries for railroad material. Since the armistice this organization has purchased about 100,000,000 francs of material in Belgium.

British Standard Rolled Steel Sections

A revised edition of the lists of British standard rolled steel sections for structural purposes has been published by the British Engineering Standards Association. The total number of standard sections now included is 113. The beam sections have been redesigned to give a greater efficiency in comparison with weight and are divided into two lists, namely, girder sections, and heavy beams and pillars. Bulb tees and zed bars are now eliminated from the standards. The form of the bulb in bulb angles and bulb plates has been considerably modified so as to give a more efficient section. The weights per foot and sectional areas of the standard sections are given in the present report, and it is understood that the other properties of the sections, such as the moments of inertia, will be issued in a later publication. Copies of the report may be obtained from the offices of the British Engineering Standards Association, 28 Victoria Street, S. W. 1, London, England.

Steel Trade Conditions in Sheffield

WASHINGTON, Nov. 1.—Conditions in the steel trade in the Sheffield district are reported by Consul William J. Grace from Sheffield, England.

"Buying of pig iron and of all classes of steel is at a standstill," says Mr. Grace. "The tool-steel trade is very dull, and large numbers of people in this branch of trade are unemployed. On the other hand, the makers of saws, files, and joiners' tools are unable to keep up with the demand. Some branches of heavy steel, such as castings and forgings and railway material, are fairly busy. Prices of basic steel are lower and quotations therefor from the United States are under those of British makers. There is no foreign competition for acid quality of steel, but prices for this class of steel are firm.

"During the past week, an order for the United States for hollow steel bars was completed. It consisted of 160 bars, each measuring 62 ft. long by 2 in. diameter, intended for rock boring in America. These are said to be the largest tools ever made, as the longest previously reported averaged from 20 to 30 ft.

"Unemployment is now extending every day, particularly in the engineering branches. There is great depression in the crucible steel and electric steel departments. Business with the automobile industry has fallen off to a lamentable degree. It is reported that there are large quantities of Government surplus stocks still on the market and that several users have purchased sufficient of these stocks to last for several years. The slackness in special steels has had a like effect on ferroalloys. There is an abundance of metals used in the manufacture of high speed and alloy steels.

"Open-hearth furnaces are still delivering heavy tonnages against old contracts. New orders in every department consist mostly of the smallest quantities necessary for current consumption. The demand for acid steel keeps up with the output. Some sections and sizes are difficult to obtain."

Fees for Consulting Engineers

Schedules of fees for consulting engineers have been compiled by Edmund I. Mitchell, assistant secretary of committee on classification and compensation of engineers, Engineering Council, 29 West Thirty-ninth Street, New York. These include various suggestions as to proper fees for engineering services put forth for the American Institute of Consulting Engineers, Connecticut Society of Civil Engineers, Iowa Engineering Society, Mahoning Valley Engineers, and the American Institute of Architects; also suggestions made by Edmund T. Perkins, president, Edmund T. Perkins Engineering Co., Chicago, to the Illinois Society of Engineers, 1918, and a fee schedule for consulting engineers in the Kansas City district prepared by W. L. Benham. Three methods of charging are covered by the schedules, i.e., a percentage of the cost of the completed project, a per diem rate, and a fixed sum.

High Price for Coal Land

UNIONTOWN, PA., Oct. 30.—What is believed to be the highest price ever paid in Fayette county for undeveloped Pittsburgh vein of coal has just been paid by Wilmer H. Wilkey for a tract of 20 acres in Menallen township which he has purchased from John Newton Hibbs for $3,600 an acre.

New Mill to Roll Automobile Sheets

Powdered Coal Used Exclusively in the Plant of the Newton Steel Co. That Is Designed for the Manufacture of High-Grade Sheets

A RECENT tendency in the sheet mill industry has been toward the erection of plants devoted to the manufacture of automobile body sheets. For a long time the demand for full pickled, full cold rolled and re-annealed sheets for automobiles taxed the capacity of the sheet mills, and with the recent slowing down in the automotive industry the surplus product has been absorbed by manufacturers of metal furniture and other consumers of high grade sheets.

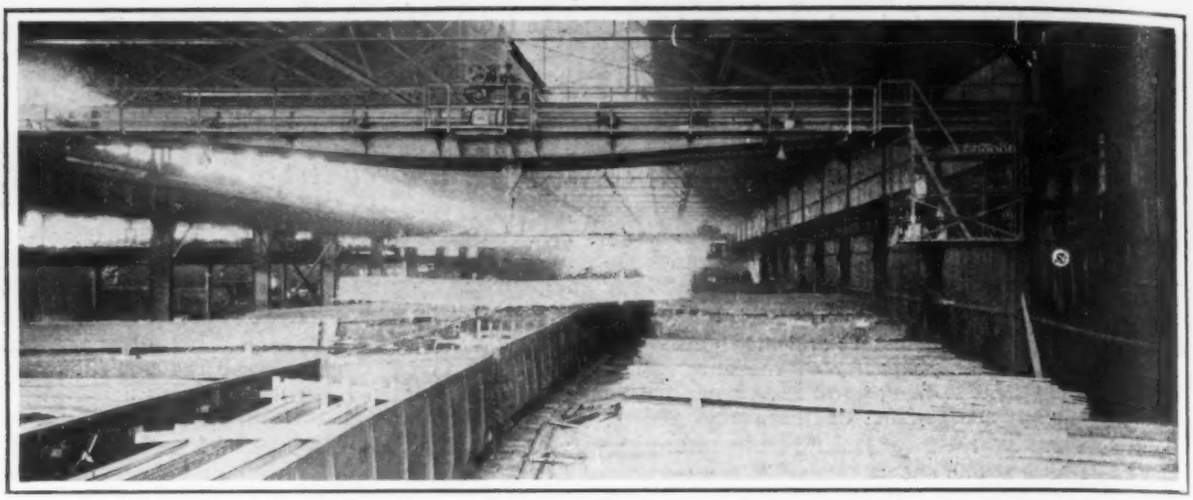
A recent addition to the sheet industry in the Mahoning Valley is the plant of the Newton Steel Co., Newton Falls, Ohio, whose product is high grade sheets, about 80 per cent of the output being intended for automobiles. The company manufactures sheets from 14 to 28 gage exclusively, in widths up to 48 in. and lengths up to 136 in. The erection of this plant established a new producing point in the sheet steel industry. Newton Falls, a village about nine miles southwest from Warren, was selected because of good railroad facilities, abundance of water and easy access to the southern Ohio coal fields by a direct line. The plant occupies a 150-acre site between the two branches of the Mahoning River and is on two lines—the Baltimore & Ohio Railroad and the Lake Erie, Alliance & Western branch of the New York Central Railroad. With this location, away from the steel producing centers of the Mahoning Valley district, the company has been able to recruit a force composed largely of American workmen.

In laying out the mill, convenience and economy in handling material were considered first, there being practically no "backtracking" from the time the sheet bars enter the plant until the sheets are shipped out. All manufacturing processes are carried on under one roof in two adjoining main buildings and two narrow buildings, or lean-tos, making virtually four bays 800 ft. in length, and with a total width of 265 ft. One main building contains a sheet bar storage bank, hot mill and shearing department, and the other the annealing, cold mill and finishing departments and warehouse. Powdered coal is used for fuel in the sheet and pair and annealing furnaces and under the boilers. The entire plant is electrically operated, current for power being supplied by the Trumbull Public Service Corporation.

The storage and hot mill building is 90 ft. wide and 800 ft. long. One end is used for the storage of sheet bars and the remaining 500 ft. for the hot mill and shearing departments. Storage capacity is provided for 10,000 tons of sheet bars, and two traveling cranes, 30-ton and 10-ton, have been provided. These and all other cranes were furnished by the Alliance Machine Co. Loaded cars are delivered into the building and the sheet bars are unloaded by the overhead crane. Steel is purchased from various mills, low phosphorus bars of special analysis being specified in order to produce sheets with the required deep drawing qualities and without pits or other surface defects. The bars are purchased in 30 ft. lengths, 8 in. wide and in various thicknesses. The storage room is equipped with two heavy duty alligator shears, supplied by the United Engineering & Foundry Co., and having a capacity for cutting a 3½-in. square bar.

The sheared bars are delivered into the adjoining parallel building along the outer side of the plant. Two pickling vats are located at one end of this building opposite the storage department

A 10-Ton Crane Delivers the Sheet Bars from the Sheet Bar Pickling Department to the Charging Side of the Sheet and Pair Furnaces. The pair furnaces are of the Allis continuous type with electrically operated pushers. The burner and the pipes that deliver the pulverized coal and blast at the back of the furnaces are shown in the illustration



Sheet Bars Are Unloaded with an Overhead Crane Directly from the Cars in the Sheet Bar Storage Department

and the sheet and pair furnaces are at the lower end. The pickling vats are used exclusively for pickling sheet bars, it being the usual practice in making automobile body sheets to remove the scale by pickling before the bars go to the pair heating furnaces. Two 10-ton cranes deliver the sheet bars from the sheet bar pickling department to the charging side of the sheet and pair furnaces.

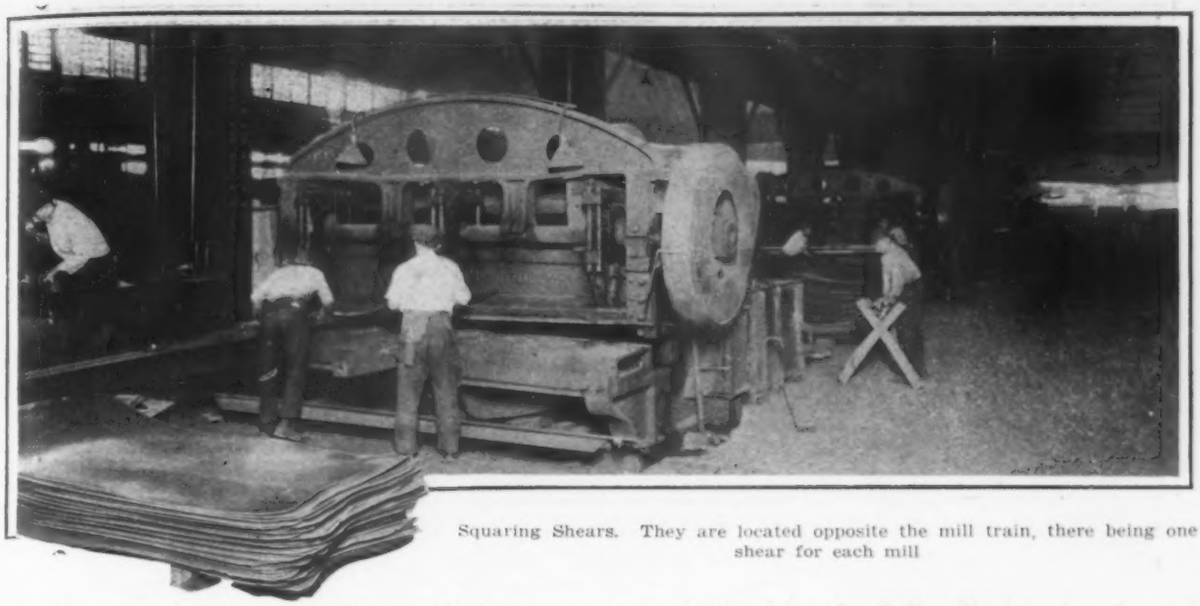
The sheet and pair furnaces are 20 in number. The pair furnaces of the Allis continuous type have a charging box provided with V-shaped grooves. The pusher is electrically operated and automatically controlled. The sheet and pair furnaces were designed by the Fuller Engineering Co., Allentown, Pa., and were erected by the Newton Steel Co.'s contractor. The bars are discharged from the furnaces back into the next bay or mill building, the fronts of the furnaces being alongside this bay. The furnaces are located to provide ample room between them and the mill train, the distance being 30 ft.

There are 10 finishing and 10 roughing mills, each finishing mill having an adjoining individual roughing stand, this arrangement tending to an increased production as compared with the more general plan of having one roughing mill for two finishing mills. The train is composed of 38, 44, 48 and 54 in. mills, all rolls being 28 in. in diameter. The rolls have 22-in. necks and 20-in. wabblers. The mills are driven at 30 rev. per min. by a 2000-hp. Westinghouse induction type motor centrally located between the mill stands, through an 8 to 1 herringbone reduction gear. There are two 25-ton flywheels 12 ft. in diameter. The hot mills were built by the Hyde Park Foundry & Machine Co. and the reduction gear drive was furnished by the Mesta Machine Co. A Francke flexible coupling connects the motor to the pinion shaft. The spindles and coupling boxes are of cast steel, made by the Stroh hardening process. The care of the mill rolls is a matter of importance, the surfaces being kept well polished in order to give the product the desired finish. Each mill unit is provided with a steam driven doubling hammer.

In connection with mill and furnace operation, attention may be called to the provision made for the comfort of the men. An air cooling system is provided which consists of two blowing units, one for each five mill stands. The blowers, supplied by the Buffalo Forge Co., are located just inside the plant, taking in fresh air from outside. The air is delivered through 3-ft. mains under the floor to 10-in. outlets that extend 30 in. above the floor. There are 50 to 60 of these outlets located as needed around the mills and in front of the furnaces. Each outlet has a swinging elbow so that the blast can be turned in any direction. This blower system takes the place of water cooled standings provided in some mills, and their advantage is that they supply fresh air from outside, while the standings only reduce the temperature of the existing air.

A hood is provided over each furnace to carry away the fumes and smoke that arise when the doors are open. From the hood there are two outlets that join together in a larger pipe leading to the furnace stack. Cold drinking water is piped to various points around the mills, being supplied from three deep wells. The provisions for the comfort of the men are credited with a remarkable

Hot Mills in Foreground and Pair Furnaces in the Background. At the right is one of the blower outlets with pipe extending from the floor, delivering fresh air around the mills. Hoods in front of the furnaces carry away the fumes and smoke



Squaring Shears. They are located opposite the mill train, there being one shear for each mill

operation record during August a month when output is usually low because of weather conditions. During that month the plant was operated 698 out of a possible 700 turns, or at 99.71 per cent. of full efficiency.

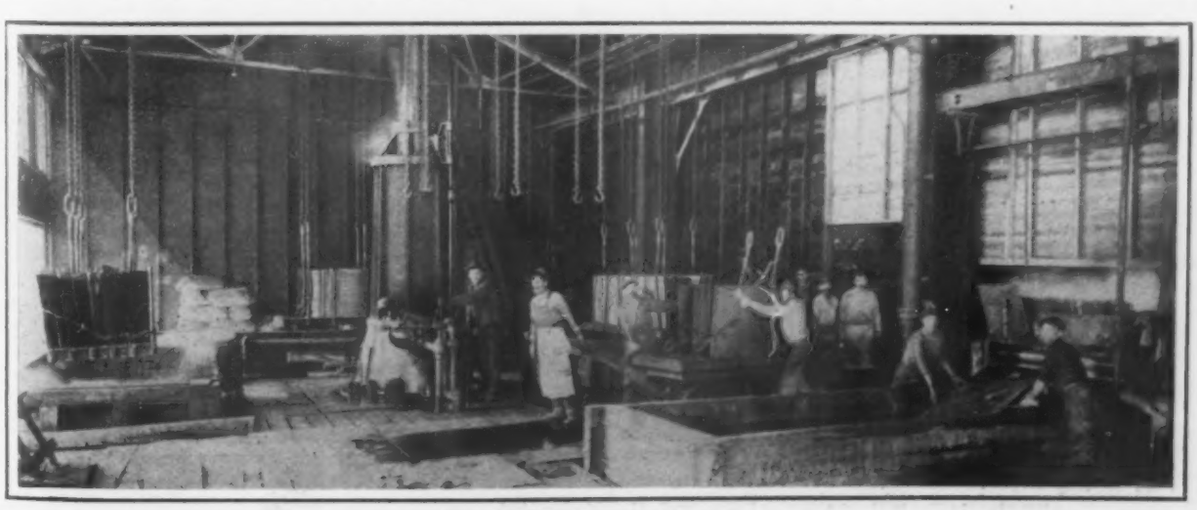
The packs go from the mills to the squaring shears, which are located in the mill building directly opposite the mill train. There are ten 126-in. and 156-in. motor-driven shears, one for each mill. After the packs are squared to size the sheets are delivered directly across to the annealing department which occupies the lower 500 ft. in the next adjoining bay. Here after weighing they go through the various operations of cold rolling, annealing, pickling and re-annealing. Practically the entire product is pickled after annealing and before the three final passes through the cold rolls. The pickling department is in a lean-to 35 ft. wide adjoining the annealing floor. The annealing furnaces are also in this lean-to, with their doors alongside the annealing floor. Pickling is done on two of the largest type of Mesta pickling machines. This department is also provided with two drying machines.

The sheets are box annealed in 18 annealing furnaces, standard annealing practice being followed. A Freeman charging machine, the use of which is more general in tin mill plants, is provided for charging the furnaces. The use of this machine eliminates the V-shaped tracks and cast iron balls on which the annealing bottoms travel to the furnaces. The annealing department is served by a 50-ton overhead crane. The annealing furnaces were designed by the Fuller Engineering Co. and were built by the Newton Steel Co.

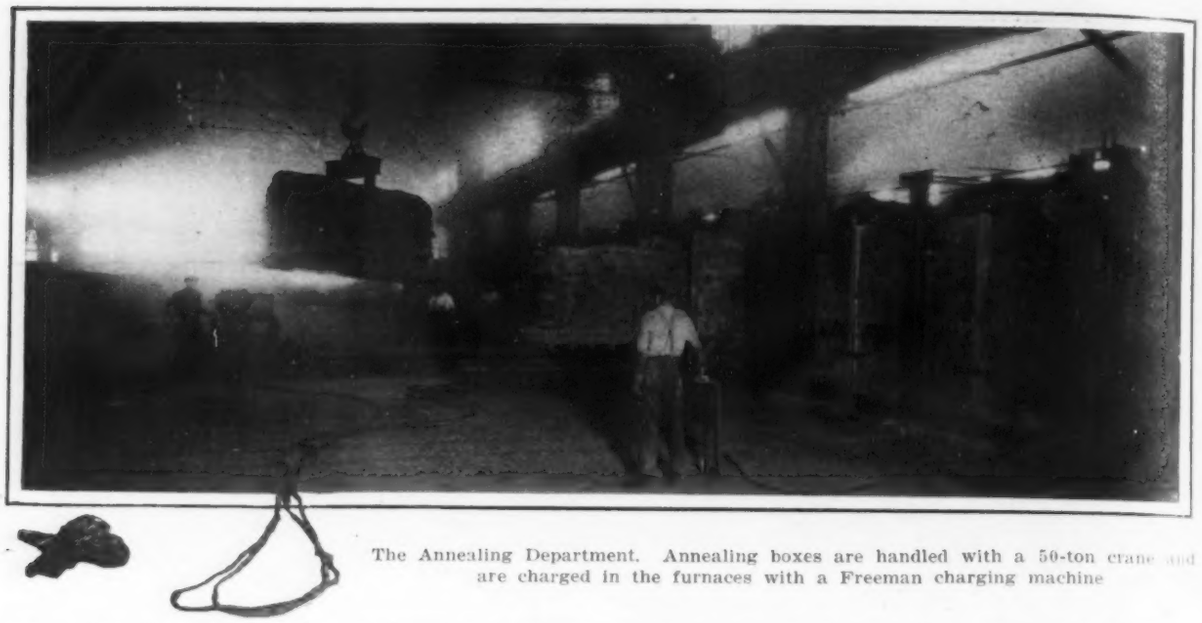
There are two trains of cold rolls, five stands to a train, that are set at right angles to the length of the building between the annealing department and the warehouse. These are 54-in. and 48-in. mills, supplied by the Hyde Park Foundry & Machine Co. Each mill train is driven by a 250-hp. Westinghouse motor driven at 350 r.p.m.with a speed reduction to 42 r.p.m. through a Falk Co. reduction gear set.

The warehouse occupies a space 300 x 90 ft. and has adjoining high and low transverse roof sections in order to provide good lighting facilities from above and to permit the proper inspection of the finished sheets. The warehouse is of hollow brick and steel construction and has a creosoted wood block floor. The equipment includes three roller levelers of the Morton-Poole type, three Hyde Park Co. re-squaring shears, two Globe Foundry Co. stretcher levelers, and an oiling machine. A large part of the product is oiled for shipment. All sheets are inspected individually and sheets having any small defects, such as pit marks, are classed as seconds. The warehouse is equipped with a 10-ton crane, and another crane of the same capacity on the same runway serves the cold mills. All loading is done from a shipping platform 20 ft. wide and 300 ft. long, under roof and adjoining the warehouse. Sheets are delivered into cars from the warehouse on a storage battery truck built by the Lakewood Engineering Co.

The powdered coal plant, which was installed by



The Pickling Department



The Annealing Department. Annealing boxes are handled with a 50-ton crane and are charged in the furnaces with a Freeman charging machine

the Fuller Engineering Co., occupies a separate building near the lower end of the mill buildings. Coal delivered in hopper cars is dumped into a track hopper, and is crushed in a 24-in. Jeffrey single roll crusher. It is then elevated to a 30-ton bin, located above a Fuller indirect fired rotary drier 30 ft. in length.

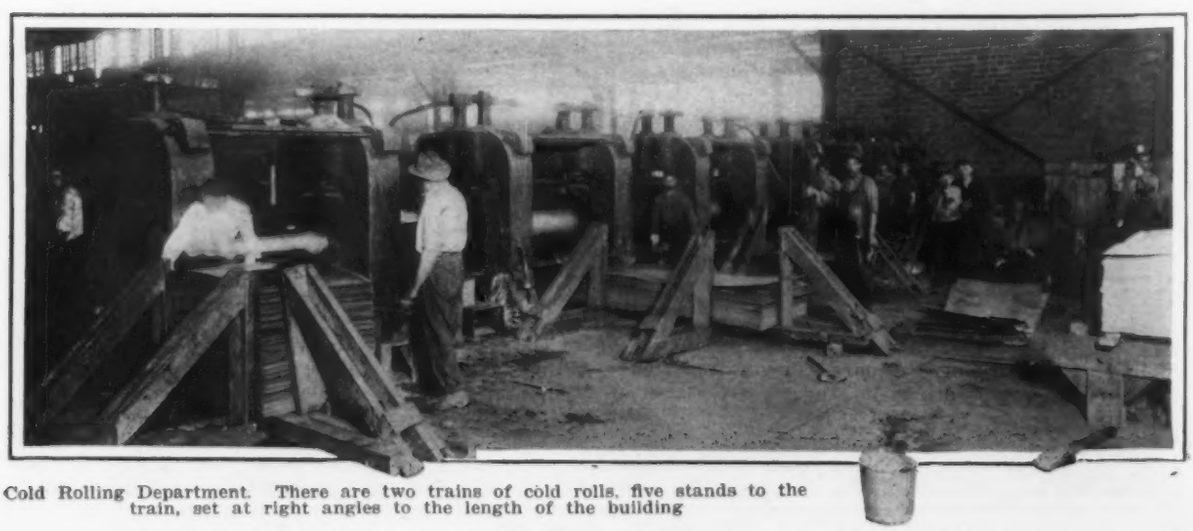
From the drier the coal is elevated to two 15-ton bins located above two 42-in. Fuller Lehigh pulverizers and is pulverized to a fineness that will permit 85 per cent of the powdered coal to pass through a 200 mesh screen. From the pulverizers the coal is delivered by Fuller-Kinyon pumps to 25-ton storage bins under which the pumps are located. From the storage bins the pumps deliver the coal through 4-in. conduit and Fuller switching valves to steel bins located at the various furnaces. The pumps, which are direct connected to motors, operate at 750 r.p.m. and supply the pulverized coal to the air end of the pump in proper proportion to the air being used. A diverting valve or cross-over is used to connect the pumps to all distributing lines.

The sheet and pair furnaces are each served by 3-ton bins, the annealing furnaces by 4-ton bins and the boilers by 5-ton bins, all equipped with electrically operated signals which indicate when the bin is full or requires filling. From the bottom of each bin a screw coal feeder delivers the fuel into a supply line in which it is mixed and conveyed by air to the combustion chamber through a burner in the back of the furnace. Two Buffalo Forge Co. blower units are used, one for each ten furnaces. The blower is connected to a 22-in. diameter galvanized steel duct that extends alongside the bins is reduced in diameter as branch lines are taken off. A 4-in. air line from the main duct connects with each coal feeder and an 8-in. auxiliary or secondary air supply is connected to the burner to regulate combustion. All lines and burners are provided with gates for regulation. Both the fuel and blast lines are carried in a covered trench just beneath the floor back of the furnaces.

The pulverized coal bins for the sheet and pair furnaces are along the outside of the building immediately back of the furnaces. The location of the bins is an important safety feature, as danger of having the fuel catch fire by being above or too close to the sheet and pair furnaces is avoided.

The plan of the fuel distribution system for the annealing furnaces is similar to that used in the sheet and pair furnaces, but the pulverized coal bins are located immediately back of the combustion chamber, necessitating a slightly different arrangement of the pipes.

The most prominent feature of the sheet, pair and annealing furnace design, compared with other furnaces of this type, is the large combustion chamber. The purpose of this is precipitation and removal of ash. Clean-out openings, fitted with suitable doors, are provided and once every three or four weeks the powder ash accumulation is removed. The



Cold Rolling Department. There are two trains of cold rolls, five stands to the train, set at right angles to the length of the building

heating chamber temperature is maintained uniformly and no interference has been found from ash deposit. Only one-half the coal used in hand fired furnaces is required when pulverized.

The boiler plant is equipped with two 250-hp. Stirling water tube boilers that supply steam for pickling machines heating the warehouse and operating an air compressor, the latter used for supplying air for the Fuller-Kinyon pumping system. The boiler setting and fixtures were designed by Fuller Engineering Co. and built by Newton Steel Co.

Scrap is baled in a hydraulic press located in the lean-to adjoining the sheet bar storage department. A baling machine was furnished by the Logemann Bros. Co., Milwaukee. The plant is provided with a machine shop 40 x 200 ft. in which all equipment is motor driven. The mill building was erected by the McClintic-Marshall Co.

The Newton Steel Co. was incorporated in June, 1919, by men who have been prominent in the sheet industry in the Mahoning Valley. E. F. Clark is president; H. M. Steele, vice-president and general manager; R. A. Kenworthy, Jr., general sales manager; J. H. Fitch, Jr., treasurer; John Stambaugh, 2nd, secretary. General offices are in Youngstown.

Construction of the plant was started July 1, 1919, and the first sheets were rolled April 12. To take care of the housing shortage caused by the influx of labor employed in the mill, the Newton Realty & Construction Co., in which the Newton Steel Co. is largely interested, was formed, and this company has erected 112 houses, most of which have been sold to employees.

Automatic Hydraulically Operated Regulating System

Applications to Control of Steam, Gas, Moisture, Water, Temperature and Electric Current—Power Plant and Electric Furnace Uses

THE Arca system for the automatic regulation of steam, gas, moisture, water, temperature, electric current, etc., now in use in various industries in Sweden is being introduced in the United States by American Galco, Inc., Grand Central Palace, New York. The feature of the regulator is the sensitive and positive control. The auxiliary motive power is derived from water under pressure which can be regulated to deliver the required degree of adjusting force.

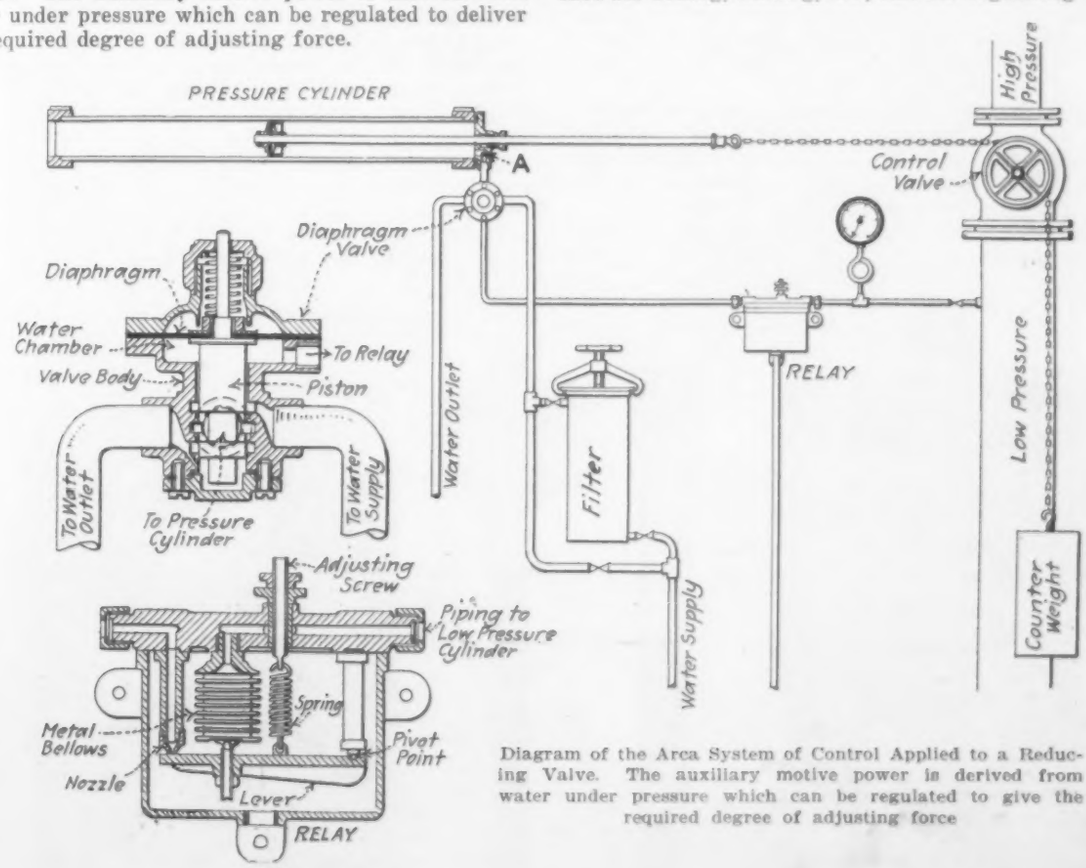


Diagram of the Arca System of Control Applied to a Reducing Valve. The auxiliary motive power is derived from water under pressure which can be regulated to give the required degree of adjusting force

A pressure cylinder which performs the regulating, a diaphragm valve and a relay constitute the working members. The form of the relay, as shown in the accompanying illustrations, changes to suit the particular installation, there being a separate device for steam and water, gas, temperature, moisture, and for electric control. Applications indicative of the scope of the system include the following: Carbon regulator for maintaining a constant amperage in the electric furnace; in steam plants on precision reducing valves wherever constant steam pressure is required, for maintaining water level in the boiler, on draft regulating, for regulating of automatic stokers, on steam traps, etc., for furnishing constant pressure gas to gas fired furnaces; in heating plants on reducing valves where reduced pressure is desired, on safety valves where steam is used for boiling, heating, etc., and for regulating water heaters, where water of a constant temperature is wanted. It is also applicable as a vacuum regulator for steam turbine condenser, as a voltage regulator for direct current generators and to regulate motor field resistance; as a moisture regulator for drying ovens; for maintaining constant water temperatures, etc.

The principle of operation is shown in the diagrammatic arrangement of the apparatus as applied to reducing valves. Here the problem is to let the water, steam, etc., from the high pressure side through the

valve to the low pressure side in such amounts that the low pressure remains constant irrespective of variations in high pressure and consumption. Here the ordinary globe valve is used, the handwheel being replaced by a sprocket over which a chain travels. One end of the chain supports a counterweight, the other being connected with the piston rod of the pressure cylinder. When the port, *A*, of the cylinder is connected with the piping for water under pressure, this will press the piston inwards in the cylinder, opening the main valve. On the other hand, when the port is connected with the drain piping, the counterweight will pull out the cylinder piston closing the main valve.

The apparatus for guiding water either in or out of the cylinder is a diaphragm valve, shown in section in the drawing. This valve has three ports, one connecting with the cylinder, another to the piping for water under pressure and the third with the drain piping. Part of the water coming in through the water supply port leaks through between the piston and valve body into the water chamber. One wall of this chamber consists of a diaphragm on one side of which the leakage water causes a certain pressure counteracted on the other side by a spring. If the water pressure on the diaphragm changes, the valve piston will move either up or down, thus connecting the pressure cylinder port with either the water supply port or the water outlet port. To make the water pressure on the diaphragm fairly independent of changes in the prime water pressure, the leakage water flows in a steady stream between the piston and the body of the diaphragm valve and out through the relay discharge port. If now the discharge through this port is suppressed in the slightest degree, it will cause an immediate and strong increase in the water pressure on the diaphragm. That is the essential point in the Arca principle.

The relay discharge port on the diaphragm valve is connected by piping with a very small nozzle in the relay, which is also shown in section. The discharge water from the diaphragm valve flows out in a tiny jet, more or less suppressed by a disk on the end of a lever which rests on pivot points and is pressed against the points and the nozzle by a spring. Counteracting the spring is a metal bellows influenced by the controlled pressure through piping to the low pressure cylinder.

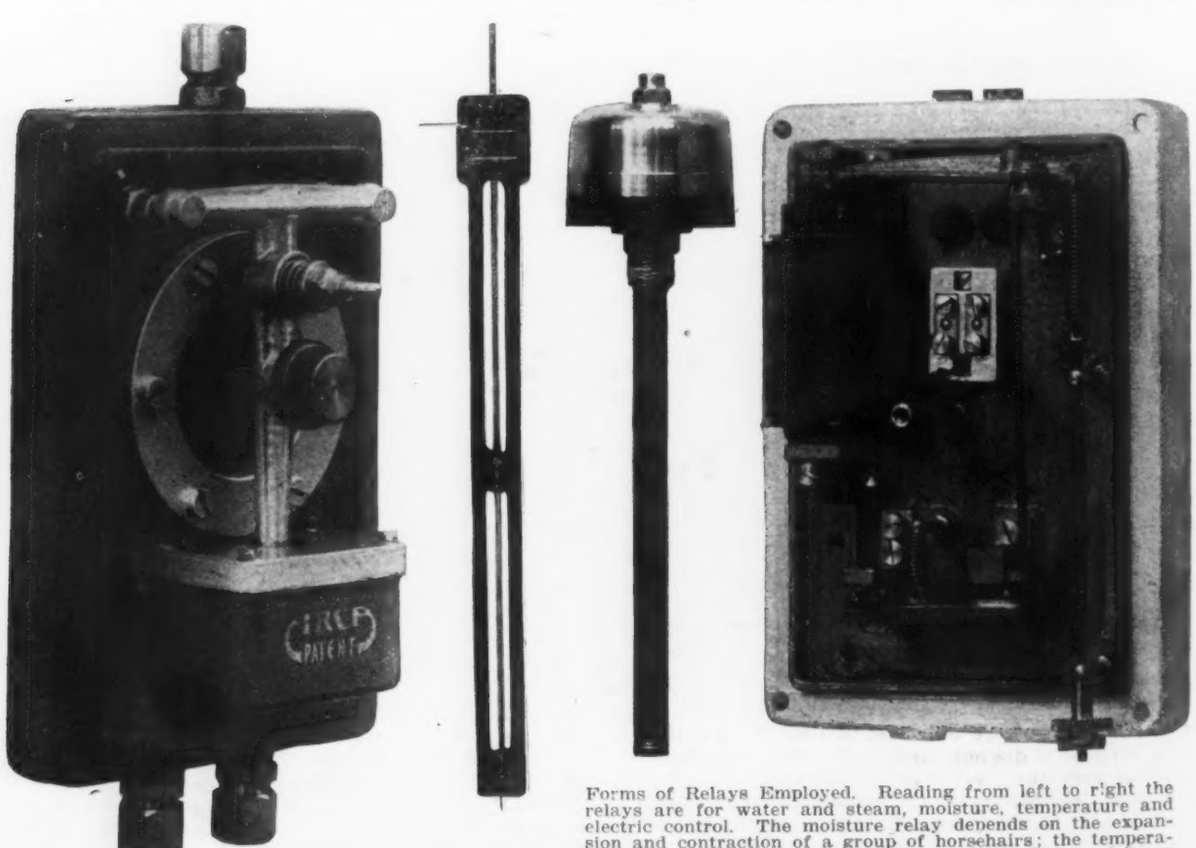
When the controlled pressure rises, the bellows expand pushing the lever a greater distance from the nozzle. More water flows out and the pressure in the water chamber of the diaphragm valve drops. The diaphragm and with it the valve piston move downward. The water supply port closes entirely and the water outlet port gets in connection with the pressure cylinder, that is, the pressure cylinder is connected with the drain piping. The counter weight pulls out the cylinder piston and closes the main valve. This movement continues until the controlled pressure decreases to the value for which the relay is adjusted. This adjusting is made by increasing or decreasing the tension in the relay spring by means of a screw. It is adjustable to any pressure within the limits for which the relay is constructed.

If the low pressure drops, the bellows contract and the spring pulls the lever closer to the nozzle. The flow of water from the nozzle is suppressed and pressure in the water chamber builds up. The valve piston moves upward, and connects with the pressure cylinder. Water is admitted to the cylinder and forces the piston to the left, thus opening the main valve.

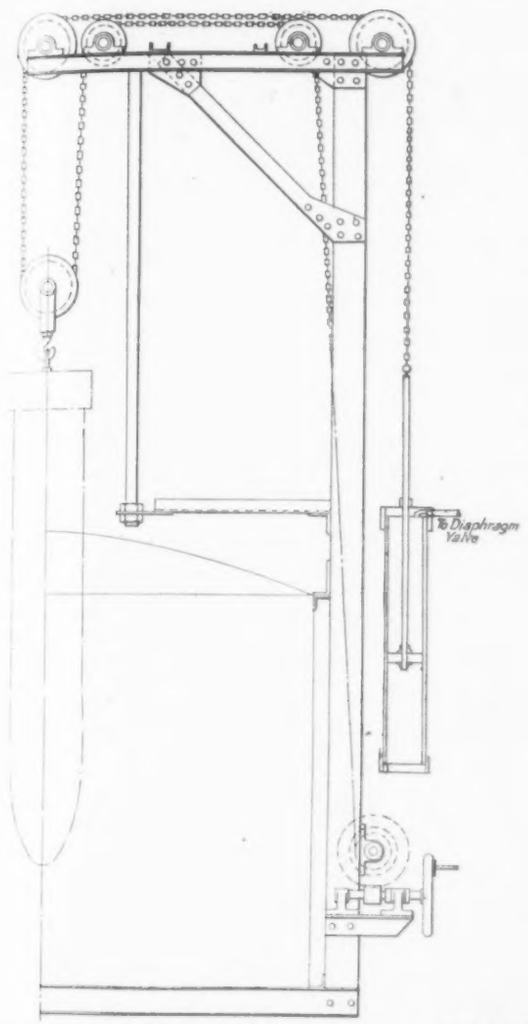
The sensitiveness of the system is indicated by the fact that a movement of 0.002 in. on the end of the relay lever is sufficient to change the position of the valve piston and make the cylinder piston move. Water was chosen as the medium for the auxiliary power on account of its noncompressibility, thus the regulating follows the impulse very closely. Variations in water pressure up to a ratio of 2 to 1 do not influence the functioning of the apparatus. For the standard apparatus, however, it must not be less than 15 lb. or exceed 85 lb. per sq. in. If the water used for the operation is contaminated, a water filter must be installed.

When the system is to be used for other purposes, the relay is equipped with other sensitive members suiting the purposes in question. The metal bellows shown in the diagram, or a bourdon spring, sensitive members now in use for controlling pressures are to be replaced in future models with a metal membrane or diaphragm. These relays will be for pressures from 2 to 300 lb. per sq. in. or vacuum from 5 in. mercury column. For pressures between ± 60 in. water column, the membranes are made of a copper sheet or of a special flexible cloth.

Temperature regulators for controlling temperatures up to 1100 deg. Fahr. are made. The relays for



Forms of Relays Employed. Reading from left to right the relays are for water and steam, moisture, temperature and electric control. The moisture relay depends on the expansion and contraction of a group of horsehairs; the temperature relay on the difference in expansion of glass and brass



Arca System Applied as a Carbon Regulator for Maintaining a Constant Amperage in the Electric Furnace

these regulators are actuated by a glass rod in a brass tube, the difference between the expansion of the brass and the glass furnishing the primary impulse. For moisture regulation, a group of horsehair is used to operate the relay lever. An electrically operated relay materially broadens the field of usefulness of the regulator.

The regulators are now manufactured in Sweden but the inventor, Ragner Carlstet, is now in the United States making arrangements for their manufacture.

Loans and Advances to Railroads

WASHINGTON, Nov. 1.—A tabulation by the Treasury Department shows that the total loans to railroads thus far from the $300,000,000 revolving fund amount to $56,190,325. Advances to railroads under the guaranty section of the transportation act total $233,719,974. The carriers to which loans have been made and the amount of each of the loans are as follows:

Boston & Maine, $5,000,000; Salt Lake & Utah, $300,000; Carolina, Clinchfield & Ohio, $3,000,000; Bangor & Aroostook, $20,000; Atlanta, Birmingham & Atlantic, $200,000; Great Northern, $15,900,000; Western Maryland, $300,000; Chicago & Western Indiana, $8,000,000; Erie, $8,000,000; Terminal R. R. Association of St. Louis, $896,925; Seaboard Air Line, $6,073,400; Chicago, Rock Island & Pacific, $2,000,000; Baltimore & Ohio, $3,000,000; Virginian Railway, $1,000,000, and the Kansas City, Mexico & Orient, $2,500,000.

Work on the enlargement and rebuilding of blast furnace No. 3 and on the third and fourth batteries of the Otto coke plant of the Steel Co. of Canada, Hamilton, Ont., has been discontinued, and nothing further will be done until the steel market becomes more settled. Notwithstanding that the company is holding up this work, it will proceed with the erection of a new wire and nail plant at Hamilton to cost $250,000.

EXPORTS ANALYZED

Comparison of Quantity and Money Value Increases Exhibits Striking Differences

In an investigation carried on by O. P. Austin, statistician of the National City Bank of New York and described in the bank's publication the *Americas* for October, imports and exports for the fiscal years 1914 and 1920 were studied in relation to quantity rather than money value, and as a result the increases do not appear so large after all. A close analysis of our export trade in 1920, for instance, which shows an increase of 5½ billion dollars over 1914, indicates that the percentage of gain in quantity exported in the six-year period is but little greater than the percentage of increase in quantity in the like period immediately preceding the war. The increase in quantity of merchandise exported in the six-year period 1914-1920 was, as nearly as can be determined, approximately 35 per cent, while the increase in quantity exported in the six-year period 1908-1914 approximated 25 per cent.

The author also gave figures that indicate a similar condition in regard to imports. By examining the principal articles imported in which quantities can be shown, it can be seen that the number of pounds of merchandise imported increased about 66 per cent when comparing the fiscal year 1920 with 1914, but the valuation of these same articles increased 244 per cent in the same period, while in the exports the quantities show an increase of 35 per cent and the valuation 225 per cent.

The 1920 imports, for example, of the principal articles named, which were valued at $3,998,900,000, would have cost at the 1914 prices only $1,977,200,000. Similarly, in regard to exports, an examination of the principal items shows a valution for 1920 of $5,474,000,000, which at the 1914 basis would have been $2,308,000,000.

Assuming that a similar relation of 1920 prices per unit of quantity occurred in those articles in which weights were not given, it would appear that the total imports into the United States in the fiscal year 1920, valued at $5,239,000,000, would, if stated at the 1914 prices per unit of quantity, have amounted to only about $2,600,000,000, and that the total domestic exports of 1920, which were valued at $7,950,000,000, would, if stated in 1914 prices, have amounted to only about $3,340,000,000, suggesting that our total foreign commerce in 1920, which totals (including foreign merchandise re-exported) $13,350,000,000, would, at 1914 prices, have amounted to but about $6,000,000,000.

An interesting sidelight of Mr. Austin's investigation is the fact that increasing imports are largely in the interests of our manufacturers, as the increase in exports consists almost exclusively in manufactures, the quantity of foodstuffs showing marked declines and that of manufacturing materials materially less in 1920 than in the year preceding the war, while manufacturing material imported shows large gains in quantity, indicating that of the increase of 33 per cent in quantity of merchandise exported, manufactures form a very large share, thus assuring to labor as well as the capital engaged in manufacturing a permanent growth in the export trade, while most of the other parts of the manufacturing world still show a falling off in quantity, as compared with the year preceding the war.

Making of Armco Iron in Moving Pictures

The boiling of the molten metal in an open hearth furnace is a feature of a 3000-ft. motion picture story which was recently made at the Middletown, Ohio, plants of the American Rolling Mill Co., and which illustrates the entire process of making Armco iron from the arrival of the ore at the blast furnace to the final inspection of the finished product. This "movie" is soon to start on a tour of technical schools, engineering societies and sales conventions. It was made by the Rothacker Film Co., Chicago. The first big showing of the pictures was to 10,000 people on a big out-of-doors screen, at Middletown, Ohio. The Armco sales department will be provided with suit case projectors for showing the film to prospective buyers.

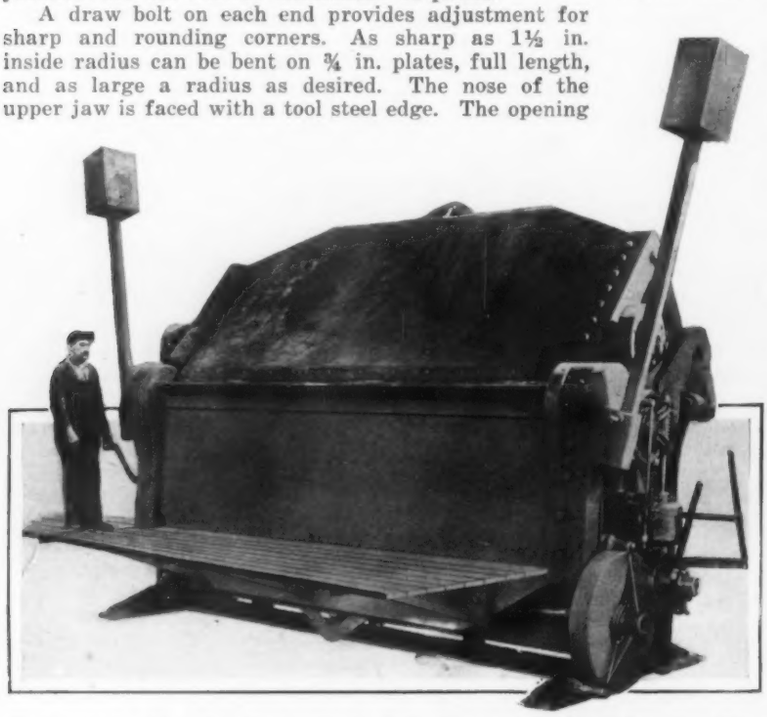
Large Plate Bending Brake

A plate bending brake of exceptional size was recently furnished the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., by the Dreis & Krump Mfg. Co., Chicago. The brake weighs 30 tons and is capable of bending steel plates 12 ft. long up to ¾ in. thick cold. It is driven by a 40-hp. motor directly connected to the brake.

The machine is steel throughout, the main body being large steel plates braced with truss rods, and the housings steel castings. The links which connect the upper and lower jaws are huge forgings. Counterweights balance the bending leaf. The motor is mounted within the machine, driving the friction clutch shaft, which has direct and reverse friction clutches. The reverse motion for the bending leaf is obtained through an idle gear.

The upper jaw is raised and lowered by a power clamp consisting of a manganese bronze gear mounted on an eccentric, controlled by a lever on each end. Friction clutches trip out when sufficient pressure is exerted on the plate. This pressure flattens buckled plates and clamps them securely and requires no adjustment for the various thicknesses of plates.

A draw bolt on each end provides adjustment for sharp and rounding corners. As sharp as 1½ in. inside radius can be bent on ¾ in. plates, full length, and as large a radius as desired. The nose of the upper jaw is faced with a tool steel edge. The opening between the jaws is such that four sides of a plate can be flanged by inserting blocks between the two side flanges after they have been bent. After the plate has been clamped, a positive friction clutch on the drive shaft is engaged, actuating the bending leaf which is driven by three steel arched racks. An adjustable dog automatically stops the bending leaf at any desired angle. When the bending leaf is lowered the racks drop below the bed so that the plate is free to pass through between the housings which permits bends to be made at any distance from the front or rear end of the plate.



Brake for Bending Steel Plates Up to 12 Ft. Long and ¾ In. Thick. Rapidity of operation and the fact that no dies are required for different thicknesses of metal or radius of bends are features

A feature is the rapidity of operation. The time consumed in making a right angle bend is less than one minute. Another feature is that no dies are required for different thickness of metal, radius of bends or degree of angle to which the plates are bent.

Machine Tool Export Corporation

A meeting of several machine tool builders will be held at the Hotel Astor, Nov. 10, to consider the incorporation of a company to handle their export trade. The corporation would be known as the United States Machine Tool Corporation and would maintain direct representation in foreign markets. Member companies would hold stock not to exceed 25 per cent of the total or less than 5 per cent. Arrangements for the meeting Nov. 10 are in charge of L. S. Devos, Grand Central Palace, New York.

Demurrage Decision Against Timken Roller Bearing Co.

WASHINGTON, Nov. 1, 1920.—Delay in unloading cars delivered in violation of the railroad company's own embargo does not prevent the latter from collecting demurrage charges, according to an interesting decision handed down by the Interstate Commerce Commission in a complaint made by the Timken Roller Bearing Co., Canton, Ohio, against the Wheeling & Lake Erie Railway Co.

The complaint grew out of the failure of the company to unload promptly 33 carloads of scrap iron delivered at its plant between May 15 and June 24, 1918. During this period the railway had in force embargoes prohibiting the movement of scrap iron to Canton except upon special permits issued by it. In March and April, 1918, according to the statement of the Interstate Commerce Commission, the Timken company placed orders for 120 cars of this material, and during May and June received permits from the Wheeling & Lake Erie for the movement of 43 cars, which were delivered. In addition, the railroad company accepted from its connections at Toledo and Cleveland 33 cars, which it also delivered to the plant of the complainant, which declared they were in excess of its ability to unload in the time allowed, it having relied upon the enforcement of the railway company's embargoes to prevent the movement of cars for which no permit had been issued, stating it was able to take care of all cars except the 33 cars which it claims were moved in violation of the embargo.

The railway company contended that the Timken concern should have countermanded part of its orders, and set up the declaration that an embargo is an extraordinary remedy imposed for the convenience of the carrier and may be removed or the terms thereof waived without notice to a consignee, provided such action does not result in unjust discrimination or unlawful preference; that the acceptance by a carrier maintaining an embargo of cars tendered for an embargoed point, without the necessary permits, constitute a waiver, as to those cars, of the terms of the embargo; and that such waiver, if it only results in fuller performance of the carrier's duty to transport freight tendered to it, may not be a ground for complaint.

The commission decided in favor of the railway company, and ordered the demurrage charges paid.

The J. B. Engineering Sales Co. has been appointed Connecticut sales agent of the Conveyors Corporation of America, formerly American Steam Conveyor Corporation, Hartford, Conn. This company is owned by John Breslau, formerly sales engineer, manager of publicity, and production manager of the Terry Steam Turbine Co., Hartford. The J. B. Engineering Sales Co. is also sales agent for the Griscom Russell Co. and the Terry Steam Turbine Co. in Connecticut.

Steel Corporation plants at Farrell, Pa., in the Shenango Valley are unaffected as yet by declining business in iron and steel and are operating at full capacity, though some of the independents are heavily curtailing. Prospects for continued operation of the works of the major corporation and its subsidiaries are bright.

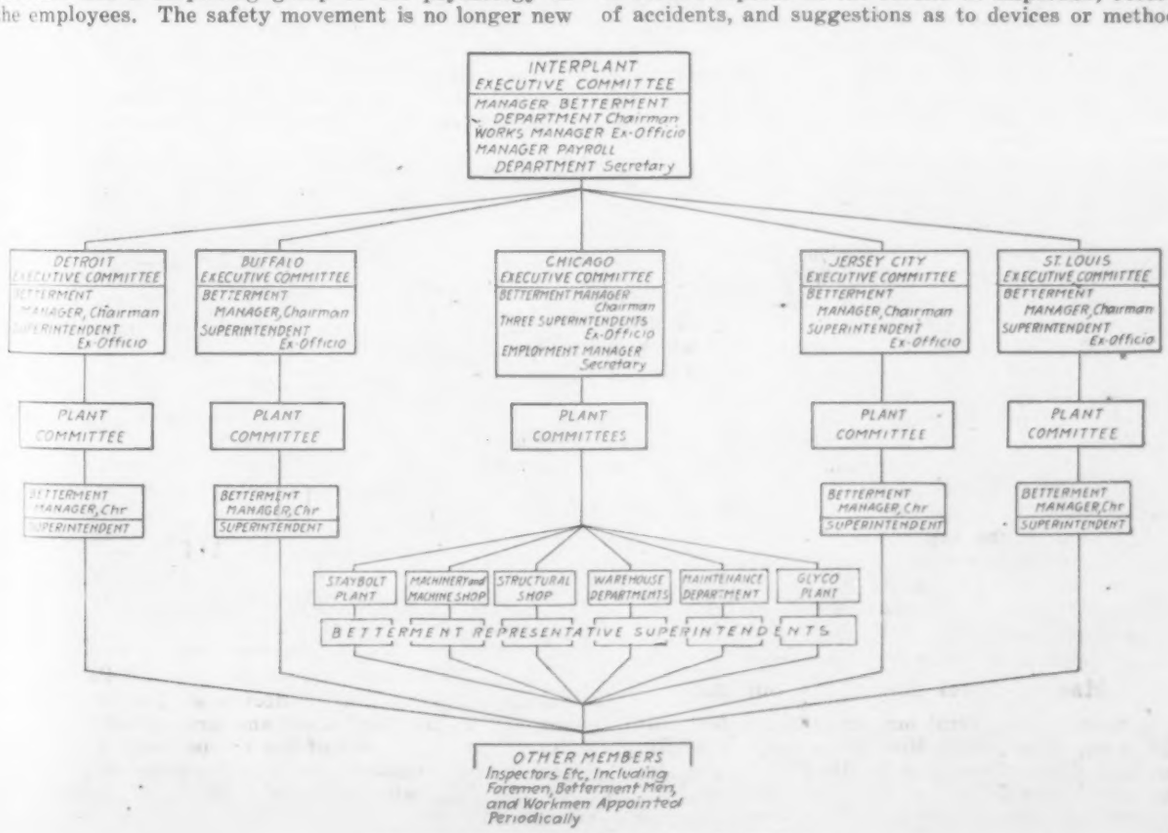
Employees Rewarded for Self-Protection

Ryerson Company Regards Safety Work as a Business Necessity, Justified as Well by Practical Considerations as by Humanitarian Motives

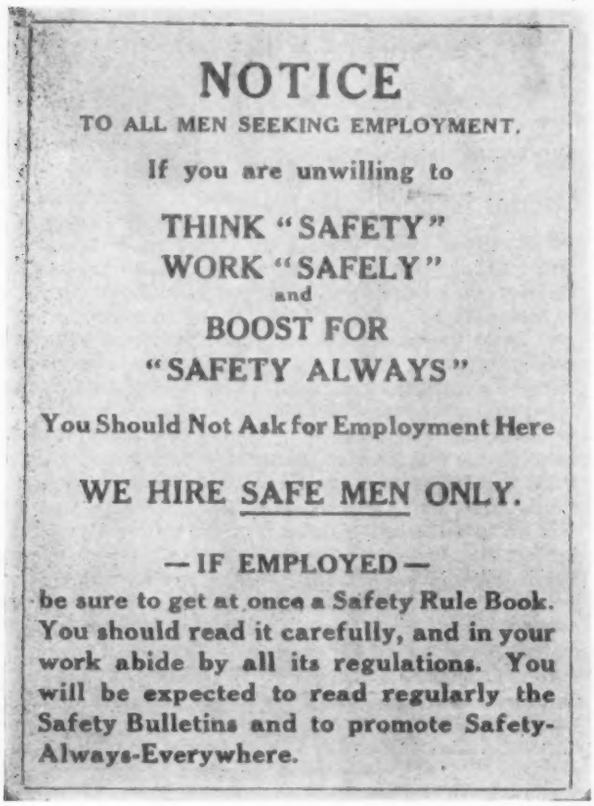
TO pay an employee for safeguarding his own life and limb seems strange at first thought. Surely it should be unnecessary to foster with monetary inducements a workman's heed for his self-preservation, which is said to be the prime instinct of man. Yet experience shows that men grow careless even of their own safety unless they are kept ever mindful of the dangers surrounding their work. Safety devices are of some avail as a protection against accidents, but records show that most casualties result from the carelessness of the injured or their fellow workmen. The success of safety work is measured by the extent to which the attention of the workman can be directed to the hazards of his occupation. Cash rewards constitute one method of gaining the attention of the employee.

But why pay a man to do something which his self-interest and common sense should cause him to do in any case? Isn't that an excess of humanitarianism? The answer of Joseph T. Ryerson & Son is an emphatic "No." Although this company does not deny that humanitarian motives are responsible in part for its safety work, it is also free to admit that accident prevention is fully justified on practical grounds. An accident always means loss of time for the employee injured and generally an interruption in operations in the department in which he works. Believing thoroughly in the utility of safety work, the Ryerson company has perfected a well-worked out organization, embracing all its plants, which carries on a persistent campaign in the interests of accident prevention. The offering of prizes to employees with safety records is merely an incident of the work carried on from day to day; yet it throws much light on the earnestness with which the company has undertaken to solve the accident problem and a surprising grasp of the psychology of the employees. The safety movement is no longer new and methods which proved successful in gaining the interest of workmen at first are now hackneyed. It should also be borne in mind that the average workman is of practical turn of mind and none too responsive to abstract exhortation. He is also often suspicious of anything savoring of welfare work, even though inspired by the best of motives. The efforts of the Ryerson company, therefore, have been concentrated on devising effective methods of winning and keeping the interest of the employee, which presupposes, of course, first gaining his confidence.

Safety work in the Ryerson organization is not new; in fact, it has existed for years in an informal way, but it was not until 1915 that an intensive safety campaign was inaugurated. Since that time a well-worked out system of committees has been established throughout all the plants of the company. The organization for safety promotion is shown on the accompanying chart. It will be noted that the direction of the work is in the hands of the betterment department, which also has charge of the standardization of operating methods and equipment, the improvement of plant layouts and kindred matters. In each plant or department the betterment representative, the superintendent, the general foreman and the maintenance or repair foreman are permanent members of the safety committee. The betterment man acts as chairman because the superintendent's routine duties prevent his giving appropriate attention to the work. The size of the general membership of the committee is such as to insure every employee a place on that body once a year, with the personnel changing every month. Each workman member acts as a safety inspector during his term of office; hence diverse viewpoints are brought to bear on the same problem. One monthly meeting is held to transact business, that is, to receive reports on the results of inspection, records of accidents, and suggestions as to devices or methods



Ryerson Organization for Safety Promotion


NOTICE
TO ALL MEN SEEKING EMPLOYMENT.
If you are unwilling to
THINK "SAFETY"
WORK "SAFELY"
and
BOOST FOR
"SAFETY ALWAYS"
You Should Not Ask for Employment Here
WE HIRE SAFE MEN ONLY.
— IF EMPLOYED —
be sure to get at once a Safety Rule Book. You should read it carefully, and in your work abide by all its regulations. You will be expected to read regularly the Safety Bulletins and to promote Safety-Always-Everywhere.

This Sign Is Placed at the Entrance of the Employment Department Where All Prospective Employees Are Bound to Read It

for accident prevention. Other meetings are arranged from time to time for educational purposes. Occasionally a meeting of all the employees of a plant or department will be called, but more often smaller groups will be convened. For instance, a loader may be induced to give a talk on the hazards of his occupation, and all the loaders and shippers of the plant will be asked to attend.

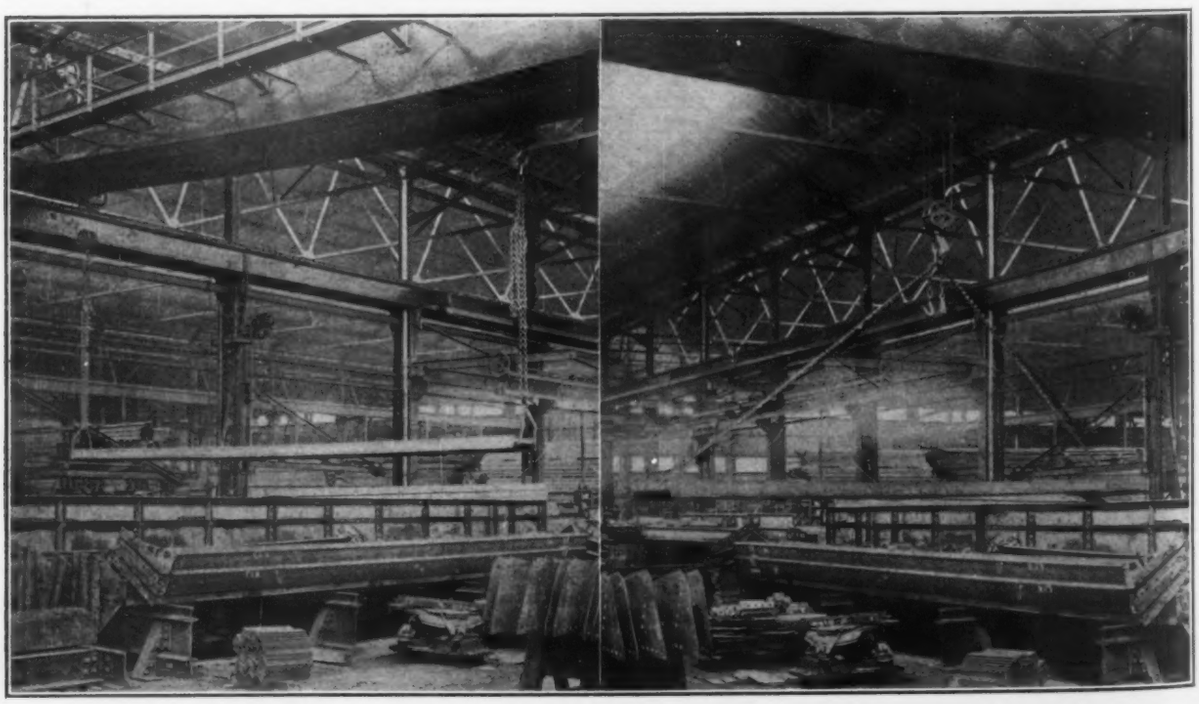
The chairman of the committee is charged with arranging the meetings, seeing that members make regular inspections, maintaining records of accidents and reviewing all suggestions from employees. Whether or not action is taken on suggestions depends on the plant executive committee, which consists of the chairman and the plant superintendent, and if the matter be too important for a decision by that body, it is referred to the interplant executive committee.

Safety contests have proved a very effective means of stimulating interest in the Ryerson plants. A given contest lasts for a period fixed by the interplant executive committee, which outlines all its conditions and decides the character of the prizes. Usually warehouse is ranged against warehouse, department against department, foreman against foreman, and workman against workman. Thus the Chicago warehouse department and the outlying warehouse plants will compete in one contest and the special Chicago departments, such as the machine shop, structural shop, etc., in another, the reason for this division being the fact that working conditions are more nearly alike in the respective groups. The plant or department which has the highest percentage standing at the end of the contest is declared the winner and each employee, eligible through length of service, receives a reward in cash. In these contests accidents are gaged by the time lost from work as the result of an injury. In no case is a plant charged with an accident unless it means the loss by an employee of one day's time; nor is a plant charged with the loss of one man for over 30 days in succession. Even though his plant or department fails to win a given contest, the individual workman with a perfect record receives a cash reward. If he happens to be in the winning plant, of course, he receives two prizes. As a matter of fact, over 90 per cent of the employees of the Ryerson plants make perfect scores. This percentage is high and ample testimony to the success of the work; yet it has no significance for purposes of comparison, as accident records vary according to the character of the industry, the plant working conditions, the intelligence of the employees and other factors.

It is recognized by the Ryerson company that a foreman can be a hindrance to safety work, even though not actively in opposition, by merely being passive in his enthusiasm. On the other hand, he can give a great impetus to accident prevention if he chooses to do so. Ryerson foremen are given a practical incentive to promote safety work. Every month the foreman whose department is leading in a contest receives a cash prize.

The size of the various cash prizes depends on the character and tenure of the contest and the discretion of the interplant executive committee. Usually a contest lasts six months, but sometimes special conditions make a longer period desirable.

"The proof of the pudding is the eating." Likewise the measure of the success of a safety movement is the



A "Right and Wrong Way" Bulletin. Spreading the two hoists would permit the beam to fall, but held with chains extended from one hoist the load is safe

A High Speed Friction Saw Cutting a 12-In. I-Beam. Note the heavy machine guards and the safe position of the operator. Goggles are worn as an additional precaution.

interest taken in it by the workman in the ranks. The contest plan has proved very effective in giving the work a real place in the lives of the employees, for the cash prizes are sufficiently convincing even to the most obtuse mind that safety appeals are something more than abstract rhetoric and really have behind them the earnest purpose of the management. The rivalry engendered by the competition between plants and men is probably even more effective in holding the interest of the employees than the monetary considerations involved.

That contests justify their ends has been illustrated by numerous incidents which have come to the attention of the management. Toward the end of a very close race an employee reduced the standing of his department through an act of gross carelessness. So intense was the feeling that developed against this man that the company was forced to remove him from the department.

Sometimes the zeal of the individual workman to keep his fellow from indulging in dangerous practices has gone to the extreme. In one instance an old hand noticed that a younger workman had an improper set-up of work in a lathe, and in explaining the danger involved lost the tip of his finger by the very accident which he sought to avoid. While all concerned regretted this unfortunate incident, it nevertheless served as one of the most telling object lessons in the experience of the department.

Safety bulletins, motion pictures, first aid demonstrations, appropriate talks at meetings of the men, and regular and frequent inspection of the various plants all constitute important features of the Ryerson safety program. The minutes of safety meetings are posted on bulletin boards where all employees will have an opportunity to see them. They are written in a popular newspaper style instead of the stereotyped manner usually followed in organizations. An example of how the minutes are prepared is shown in an accompanying illustration. In this case, a lungmotor demonstration is interestingly described and contest standings are appended.

Off-hand one would think that accident records would show conclusively whether safety work has proved a success or otherwise. Were there no change in working conditions, the rate of labor turnover, the intelligence of the workmen, and other factors, this assumption would be justified. Actually, however, the variable conditions must be taken into consideration. Owing to the great expansion of the Ryerson company since 1915, when intensive safety work was inaugurated, it is difficult to gage the decrease in the accident rate. It is doubly significant, therefore, that notwithstanding the growth of the company and the large increase in payroll, the accident rate has been reduced at least 80 per cent and a further reduction is expected to be shown when the data for the current year are tabulated.

WHETHER THEY WANT TO OR NOT—

THIS MACHINE MAKES 'EM BREATHE!

A. Bergman and F. Ziebell Brought Back to Life, Before Chicago Plant Safety Committees

Did you ever see anyone drowned, struck by lightning, or overcome with gas? If you did, would you know what to do? In cases of this kind, consciousness can be restored, and lives saved by a knowledge of what to do.

At the monthly meeting of the Chicago Plant Safety Committee, Sept. 7, Mr. Farren demonstrated the use of the LUNGMOTOR for producing artificial breathing upon A. Bergman of the Machine Shop and F. Ziebell of the Betterment Department, who volunteered to serve as subjects. The mouthpiece was attached, the Lungmotor operated, and their chests rose and fell in response to the machine.

The Lungmotor resembles an automobile tire pump in appearance, and the plunger is operated up and down in the same manner. As the handle is drawn upward, the air is drawn from the lungs. When it is pushed down, the lungs are filled. This is continued until natural breathing is restored. Cases are on record where the machine has been operated as long as five hours on a drowned person, but at the end of that time consciousness was restored and a life saved.

Following the demonstration, Mr. Yates announced the standing of the departments in the Safety Contest from July 1 to date. This is as follows:

WAREHOUSE CONTEST

Detroit	100.00
St. Louis	99.09
Buffalo	98.87
Chicago (South, Center and North Warehouse)	98.81
New York	98.64

CHICAGO CONTEST

Maintenance	99.13
Shop	98.86
Glyco	98.73
Machinery	98.47
Staybolts	93.95

The standing is certainly close and there is a chance for any department to win, which thinks SAFETY ALWAYS, as well as SAFETY FIRST.

J. IRWIN, Acting Secretary.

Sept. 7, 1920.

Minutes of Safety Meetings Are Written in Popular Newspaper Style Rather Than in a Stereotyped Manner

Continuous Feed Disk Grinder

A semi-automatic continuous feed disk grinder known as No. 24 is the latest development of the Gardner Machine Co., Beloit, Wis. Saving of labor is a feature emphasized as it is necessary only for the operator to place the work in the fixture and remove it when finished.

The machine carries one horizontal disk wheel 53 in. in diameter, and is provided with a revolving reel which carries four work tables. The work to be ground is attached to these tables by suitable fixtures, and is then brought by the revolving reel over the surface of the grinding wheel. The tables are automatically lowered upon the wheel. Pressure to insure rapid removal of stock is secured through gravity, but this pressure may be adjusted by a compression spring. The weight of the table, it is explained, insures application of uniform pressure which can be increased by adding extra weight if the character of the work requires it.

The revolving reel is mounted on a vertical shaft driven through worm, spur and bevel gears from the gear driving the main spindle of the machine. By means of change gears, the reel may be made to revolve ¼, ½ or 1 r.p.m., thereby producing 1, 2 or 4 finished pieces per min. Other speeds may be obtained by substituting special gears.

The feeding mechanism can be started or stopped independently of the grinding wheel by a lever operated friction clutch on the driving shaft. The reel and the shaft which drives it are mounted in bronze bearings; all other shafts are carried in ball bearings. The gears are totally inclosed.

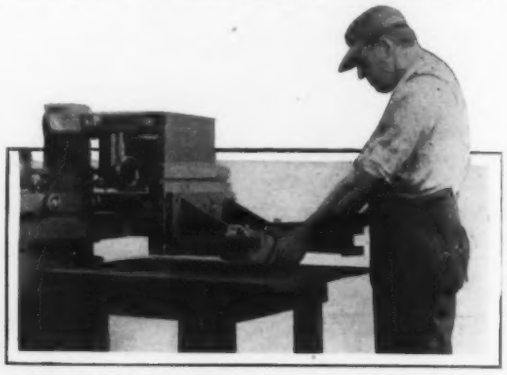
The feeding stand is bolted directly to the base plate upon which the machine is mounted, and to accommodate various sizes of work, has an adjustment of 6 in. along this baseplate.

Because the work tables are at right angles to the grinding wheel, it is pointed out that accuracy of the work being ground is assured. A micrometer stop screw permits grinding to definite dimensions, and also allows the grinding of a surface to a required relation with some other area on the piece.

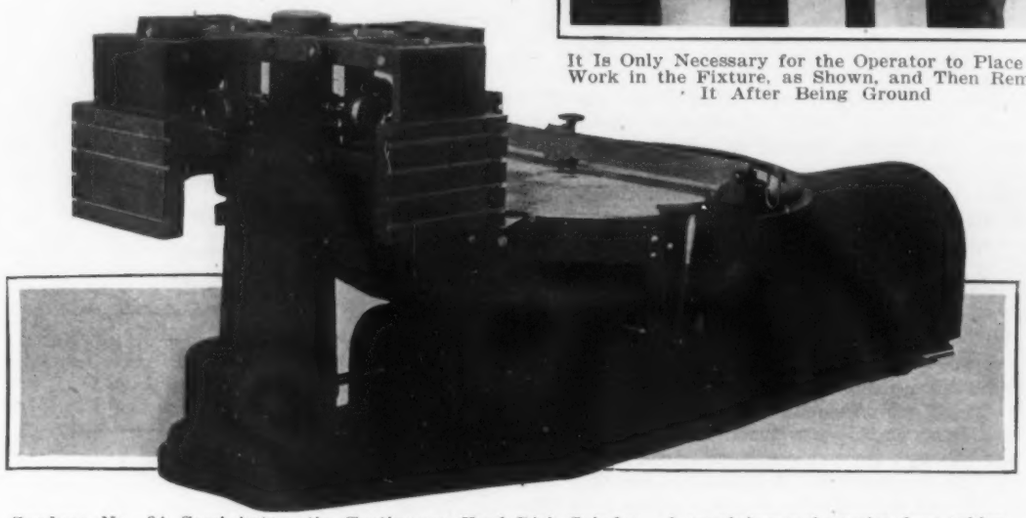
The disk wheel driving spindle runs in two self-aligning radial ball bearings and all down or end thrust is taken on a self-aligning ball thrust bearing. Power is transmitted to the disk wheel by bevel gears. The ratio between the driving shaft gear and the spindle pinion is 2.4 to 1. These gears are fully inclosed within the base of the machine.

An extra pulley is mounted on the driving shaft for belting to an exhaust fan, which is set on the floor in back of the machine. There is a dust channel cast into the base of the machine extending entirely around and underneath the outer edge of the disk wheel. When the guard ring is removed, this channel is uncovered so that any grindings which might interfere with effective exhausting can be readily removed. A dust exhaust manifold is fastened into the bottom of this dust channel in four places and connected to a large exhauster, thus to reduce the dust problem to a minimum. The cast-iron guard ring is fastened to the top of the base with collar head screws. Any portion of the guard ring is removable, permitting the grinding of work carrying a lug projecting above the plane of the ground surface.

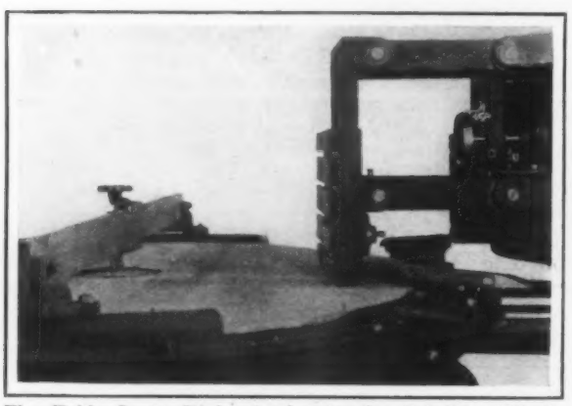
The company's patented abrasive disk brought out some time ago is recommended for use with the grinder. This disk, it is stated, will not only cut faster and cooler than the glue bond circles, but will also last much longer.



It Is Only Necessary for the Operator to Place the Work in the Fixture, as Shown, and Then Remove It After Being Ground



Gardner No. 24 Semi-Automatic Continuous Feed Disk Grinder. A revolving reel carries four tables to which the work is attached by suitable fixtures



The Table Is at Right Angles to the Grinding Wheel, Thus to Insure Accuracy of Work

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The next bi-monthly meeting and dinner of the Employers' Association of Eastern Massachusetts will be held at the Hotel Vendome, Boston, at 6.30 p. m., on Nov. 5. E. J. Cone, *Buffalo Commercial*, Buffalo, one of the open shop newspapers of the United States, will be the speaker. He was one of the principal speakers at the annual meeting of the National Metal Trades Association in New York in April.

The Government of the French Republic has filed suit in the Circuit Court at New Albany, Ind., against the Michigan Steel & Metal Co., Detroit, for $109,000, alleged to be due on sales of metal and other material to the company.

The Basic Open-Hearth Process—II*

The Various Processes — Manganese and Quality — Slag Analyses and Weight — Pouring Temperatures and Alloy Additions

BY F. L. TOY

THE basic open-hearth process, making it possible to operate with widely varying percentages of pig iron and scrap in the charge, can more readily than any other steel-making process accommodate itself to local conditions without undue increase in costs, and for this reason it has had more modifications than other processes.

The Various Processes

Allowing for a cropping off from the average ingot of 25 to 30 per cent between its initial bulk and final form as placed on the market, a final return of nearly all steel and iron scrapped in service, deduction of the amount used in blast furnace, Bessemer and acid open-hearth, and for a normal increase in demand for steel products year by year, then the charge for the basic open-hearth furnace will tend to approach an average of 40 per cent steel scrap and 60 per cent iron. In localities where pig iron is relatively high and scarce, the scrap charge may be very high, in rare cases nearly 100 per cent, when coke must be charged to give carbon in melting. This may also be the case where an open-hearth plant has been built where a Bessemer plant (a very small user of scrap) already existed, which condition may reduce the pig charge as low as 40 per cent. Other localities may have a relatively cheap and plentiful supply of iron.

The usual arrangement in this case is a duplex plant (Bessemer and rolling furnaces) in combination with stationary open-hearth furnaces, and in practically all such cases it will be found that the duplex plant has been added last to the equipment, as means of best adjusting the production of steel to the available charge. Stationary basic furnaces do not operate to give good practice on a charge running higher than 60 per cent pig, because of excessive overflow slags, and comparatively high losses. It is therefore deemed economy to use the duplex plant as a balance and since it for the most part takes its charge entirely of blown metal and adds, through its product, to the supply of steel scrap for the stationary furnaces, it helps greatly in giving them a satisfactory adjustment of scrap to pig iron in order to operate at best efficiency.

By far the largest part of the basic open-hearth tonnage is produced in the stationary furnace and the large part of this tonnage is made by a combination of the pig and scrap and Monell processes, the charge ranging from 53 to 60 per cent pig iron for the most part molten. As conditions warrant the lowering of the pig percentage below 50 per cent, then the decreasing ore charge, as scrap charge is raised, and the lower initial content of silicon, manganese, etc., tends to automatically make the operation a pig and scrap process.

Use of the Duplex Process

In two cases only is the duplex used because that process suits conditions metallurgically better than does the pig and scrap process, and produces a product economically that would otherwise be more difficult. The first case is due to high chromium pig irons, which condition can be better met by first Bessemerizing and then working through the basic open-hearth furnace. The second case is of the South, where with pig irons running 0.80 to 1 per cent phosphorus, it is extremely desirable to desiliconize and decarburize in an acid Bessemer converter, and on the transfer to a basic open-hearth furnace of the rolling type with the careful exclusion of the converter slag, refine under a slag formed from a nucleus of lime and iron oxide so as to reduce the phosphorus in the steel and form a slag rich in phosphoric acid (well above a minimum of 18 per cent phosphoric acid) which can be skimmed off for final preparation as fertilizer and a new slag made, finally reducing the phosphorus content of the steel below 0.04 per cent, allowing the steel to be tapped and finished in the ladle by necessary additions; or the metal, with phosphorus reduced to 0.07 per cent and phosphorus in the slag well above the minimum required in the use as fertilizer may be transferred to another furnace and finished.

The uses of the duplex process other than the two cases cited are primarily for rapid production under conditions where pig iron is relatively easy to obtain and a balancing of scrap supply as before described is necessary. Tilting furnaces, for the 100 per cent blown metal charge, are preferable because of the ease in getting rid of the excess slag at time of reaction. The charge other than that of starting up may be two-thirds to three-fourths blown under 0.10 per cent carbon followed by a high carbon ladle called the "kicker." This is the more common practice. Better practice is the use of molten pig iron as the "kicker" because of the large amount of manganese introduced. In this respect the general absence of manganese in the bath, the duplex process is at a disadvantage. Balanced against its frequency of tapping (heats range from 1½ to 4 hr. tap to tap) is the additional loss in conversion of 3 to 4 per cent.

The cost of plant complete per ton of ingots will be practically that of the cost of stationary furnaces per ton. As for the quality of duplex steel as against the product of the stationary furnace, it supplies a large amount of steel for the trade and for many purposes satisfactorily. There is ample field for its output and unfair comparisons with stationary furnace products that require considerable extra attention in the making are unnecessary.

Quality and the Acid Process

Definite results in making high quality steels can be attained a little more often in the acid furnace than in the basic furnace because acid furnace slags adjust themselves more readily and attain more nearly equilibrium, thus restraining the unbalanced activities of iron oxide with respect to the bath. The stationary basic open-hearth furnace on its usual pig and scrap program provides a considerable margin in this respect over the duplex process, and allows for greater control than is possible with the violent reactions due to the "kicker" and the difficulty in limiting to the right boundary of action, the swift, powerful reactions so necessary for speed. The lack of manganese in the bath is under these circumstances a more serious disadvantage, coupled with the necessary practice of large additions in the ladle and so little time for inclusions in either furnace or ladle to rise. If good steel is to be made by the duplex process it is necessary to have a sufficient amount of manganese in the bath as well as in the slag.

To provide a very flexible system as to expansion and contraction of output, to retain the advantages of rapid decarburization and desiliconization of the Bessemer converter and the advantages of balancing up of pig and scrap supply, the use of blown metal in a stationary furnace with both scrap and molten pig iron offers great inducements, and in the long run finds a broader application than the straight duplex. Consid-

*From a paper presented at the fall meeting of the American Iron and Steel Institute in New York, Oct. 22. The first portion was published in THE IRON AGE Oct. 28. The author is superintendent, open-hearth department, Homestead Works, Carnegie Steel Co., Munhall, Pa.

erable increase in tonnage over the ordinary ore, scrap and hot metal charge is possible, and a residual manganese of fair amount will be present. The product will be practically equal to that of the usual stationary furnace process in quality.

Use of Molten Metal

The use of molten metal, dating back nearly to the beginning of the process, has increased with the development of output until at the present it constitutes the greater part of the iron charge. Its use effects decided saving in time and fuel. The metal mixer has further contributed greatly to the economy of the process by giving a greater regularity to the supply and a more nearly constant chemical composition.

By far the larger part of the pig iron for basic open-hearth use is graded and accepted on analysis only, and very little attention is now paid to the physical characteristics and condition of the iron, except in the case of a few plants where it is bought in pig form and graded on both analysis and fracture, following a practice that has given good results in quality production.

Considerations as to Steel Quality

High manganese pig iron has found quite extensive use in the making of steel of required high quality in the basic open-hearth furnace. The general methods of procedure are to make practically all the basic iron high in manganese, say 1.50 to 2 per cent, or to concentrate all attention in this respect on certain of the highest quality products with a pig iron from one or two blast furnaces running up over 2 per cent, using a low manganese basic iron, say 0.90 to 1.10 per cent, for the balance of the product. The general difficulty in the case of spreading the high manganese iron over all the product is the large manganese loss in the run-off from the average trade heat with high pig percentage. Undoubtedly the greater return is ultimately in concentrating the high manganese iron in the higher quality heats where the usually lower pig charge makes for a higher residual manganese and higher manganese content of tapping slag, because of a very small or no run-off slag.

Function of Manganese

There is possibly no element that functions so well in both steel and slag as does manganese. In the first place, it confers fluidity on the slag as well as basicity. It tends to prevent the absorption of sulphur by the iron in all stages of the heat and to break FeS when formed. It acts in the latter stages of the heat to deoxidize the bath and to lessen the total amount of non-metallic inclusions. Very careful study of conditions arising in finished steel for varying manganese content of pig iron used, made at the South Works of the Illinois Steel Co., has shown its effect in helping to control the influence of high sulphur fuels and its general effect in giving a lower sulphur content in the steel, together with a better quality.

For example, the value for sulphur content in the steel and for rejection at the rolling mills over a stretch of 4336 heats show increasing sulphur content in the steel, and increasing rejections on the product of the rolling mills as the manganese content of the pig iron is reduced. For iron of 1.90 per cent manganese a sulphur content of 0.03 per cent is shown, and a figure for rejections of 7 per cent, and an increase in sulphur content to 0.04 per cent and a figure for rejections of 10.50 per cent for iron of 1.15 per cent manganese. Manganese in pig iron, through its subsequent presence in slag and steel, is admittedly an aid toward the correction of bad influences and tendencies in steel making and certainly allows us a little more leeway in use of high sulphur and poorly refined, non-uniform pig irons. Some claim that it helps toward more regular working in the blast furnace.

We must allow for all the cases where manganese comes in to round out processes and add the necessary refining action for good product, for all the benefit derived in the manufacture of very fine steels, but we must certainly count the cost when manganese is used in an attempt to correct the evils of bad iron making and bad steel making. Manganese ore can be used to good effect, but not so economically as high manganese iron. Manganese oxide is more readily reduced in the blast furnaces and functions better in the steel by working from steel to slag.

High Sulphur Pig Iron

The attempt to work pig iron high in sulphur into the charge by use of heavy lime burdens is one that is extremely wasteful of time and material as against the results obtained. The large amount of lime makes for excessive volume of slag, for poor transfer of heat to the steel, and this condition is further complicated by the viscosity of the slag which tends to hold larger amounts of iron oxide in its attempts to attain fluidity at the proper temperature for steel making. Manganese in the pig iron is here an aid through its oxide in promoting fluidity, but its use is comparatively expensive as against the net results obtained. Sulphur is so much more readily and cheaply eliminated under the reducing conditions of the blast furnace that the attempt in the basic open-hearth furnaces occasions a net loss.

High sulphur content in the pig iron is very often an indication of bad conditions in the blast furnaces, attempts at a reduction of the basicity of the blast furnace slag, of variations of temperature in controlling the silicon content, and we have rather fallen into the habit of attributing the sluggish pig iron and the bad results obtained in working the subsequent products of the open-hearth furnace to the sulphur content of both pig iron and finished steel. Thoroughly reduced, "rich" pig irons are absolutely necessary to good steel quality. The use of pig iron from special furnaces, where the effort was constantly directed toward an output of uniformly good iron, and from which no iron made in periods of irregular working, was accepted for high quality steels, has been found of great benefit in the manufacture of armor steels at the Homestead Works.

Adding Manganese Not in the Pig Iron

Very high quality forging steel has been made at the Homestead Works by use of both high and medium manganese content of the charge and a brief discussion follows. No high manganese iron being available, the manganese was charged in form of spiegel both with the pig iron and in subsequent additions to the bath during the working of the heat, the total amount added being equivalent to 5 per cent manganese in the iron charged and 2.20 per cent in the total charge. The resulting slag averaged 12.8 per cent FeO (all iron oxide estimated in this form), 14.5 per cent SiO_2 and 18.85 per cent MnO. The residual manganese at tap was 0.41 per cent. In the regular practice in making this steel the manganese content of the pig was 1.25 per cent and the content of the total charge 0.08 per cent. Two additions of 60 per cent ferromanganese were made during the last hour of working the heat, totaling 0.53 per cent Mn as referred to the total charge. The resulting slags averaged 15.85 per cent FeO, 19.10 per cent SiO_2 and 10.97 per cent MnO, and the residual manganese was 0.24 per cent. The second or regular procedure worked equally as well as that using very high manganese content in the charge.

This will introduce the question of the relative merits of the procedure where manganese is present in pig iron and the heat during melting and working, and that where lower residual manganese exists during the working of the heat, but with manganese added in concentrated form as spiegel or ferromanganese in the last stages of the working. The latter procedure serves to obtain very excellent results in the deoxidation of steel and the elimination of inclusions, and is more economical in manganese. Both methods give excellent results in making high quality steels, and like many other questions in steelmaking, many careful comparisons must be made before we can generalize by saying that one or the other is better.

Slag Analyses and Weight

The slag, notwithstanding the fact that it is the medium during the major portion of the heat through which heat is transmitted to the bath of metal for the completion of the oxidation and for the larger part of the refining action, has had comparatively little study in its relation to "everyday" production. We cannot

arrive at "worth while" conclusions in this study so long as we compare slag analyses as revealed only through the percentage of the various oxides present. There is an absolute necessity for the comparison of the weights of the elements as oxidized and going into the slag, which means a knowledge of the usual relation of slag weight to charge and of the relations by weight of tapping slag to run-off slag when the latter enters into the process. The determination of slag weights and the relative weights of the elements oxidized and going into the slag need not be made nearly so often as the slags are sampled and analyzed. The last-mentioned work should be done frequently and the analysis by weights applied at intervals for check. Only by such painstaking methods can we arrive at the best slag volumes necessary for the best relations of quality and production.

Pouring Temperatures

Pouring temperatures have received a great deal of discussion during the last three years because of the necessity of making very large tonnages of ordnance material and very important uses where lightness was desired with strength. Many definite opinions were expressed as to the part the temperature of steel has in the production of flakes, woody structure and oxide inclusions, and were in some cases applied in an attempt to generalize statements as to pouring temperature in their application to various steel-making methods in many plants, without having real quantitative data as to temperature. Long continued observation of pouring temperatures on certain classes of steel of fairly definite composition and with ingot volume fairly constant, leads one to the belief that observations, even with the best methods, are relative and must be applied only to the work in hand. An indication of the fluidity of the steel as observed from the formation of skull in the ladle is probably at present the best indication of the temperature of the steel at pouring.

Alloy Additions and Dioxidizers

Much can be said of the methods used at the end of the process in making alloy additions, of the desirability of eliminating as much as possible the "killing" of the steel in the molds and of the merits of bottom pouring as against top pouring.

Nickel additions can be made in the initial charge with but slight losses. Chromium, due to its high oxidation losses, is best added as an alloy of iron and chromium in the bath before tapping, with sufficient time, a maximum of 35 min. is usual, to thoroughly melt the alloy and give uniform bath content of chromium.

The loss of chromium by this addition ranges from 20 to 30 per cent, depending on the carbon content of the bath. Manganese additions on high quality steels are best made in the bath before tapping. Quite usual is a combination of bath and ladle additions of manganese, with a growing proportion of manganese in the bath addition as we approach the higher quality of steels.

The loss of manganese in the bath is usually twice that in the ladle. The use of crushed ferromanganese through a chute promotes efficiency and also uniformity of content in the steel in the case of ladle additions. Molten spiegel additions in the ladle have been used largely in making manganese additions on high carbon heats, such as rails, and the carbon content of the addition naturally restricts the use to such high carbon heats.

Ferrosilicon for the silicon addition must be made in the ladle, because of great losses resulting from oxidation of bath additions and the danger of rephosphorization of the steel. Introduction of finely ground ferrosilicon through a chute into the tapping spout of the furnace as the steel is running out gives very good results in obtaining uniformity of silicon content, and reduces the loss of silicon as low as 20 per cent. In this, the addition of silicon to the steel, the acid furnace has many advantages.

There is a growing tendency toward the elimination of methods of deoxidation as applied in the ingot mold by powerful deoxidizers, such as ferrosilicon and aluminum. Considerable discussion is necessary to bring out the proper uses of deoxidizers. There is a great need for deoxidizers whose products of oxidation are easily fusible at pouring temperatures so that they will unite and rise to the top of the ingot.

Conclusions

Notwithstanding a full appreciation of all that has been contributed to the art of steelmaking by the various methods in which the basic open-hearth process is applied, there is among thoughtful open-hearth men a very definite belief that much can be done toward future improvement and that the possibilities are fully as great as they have ever been. The growth of capacity, it is true, has outstripped the growth of efficiency in the methods used in employing the process, but we are getting, gradually, a better vision of our responsibility in applying methods of conservation to our resources of fuel to the heat energy in our furnaces, and to what is of greatest importance, the great problem of labor-saving.

The basic open-hearth process embodies a great and enduring principle which may for many years find application in our steelmaking processes, although through instruments and methods of which we as yet have no conception, or knowing of them, we have not yet the vision that lets us see them in terms of their ultimate economic value to us.

Two-Spindle Electric Drill

The Black & Decker Mfg. Co., Towson Heights, Baltimore, has recently designed a special two-spindle drill for attaching a fastener for automobile side curtains which require the drilling of two holes ⅞ in. apart. The new tool drills these two holes in the same operation.

Special Two-Spindle Black & Decker Drill. It drills two holes ⅞-in. apart

The handle of the drill is like that of an automatic pistol and a pull on the trigger sets the two drill bits in motion. A second pull stops the drill and in this way the operator can control the tool without changing the position of either hand. The two spindles have specially designed chucks to hold the two ⅛ in. drill bits.

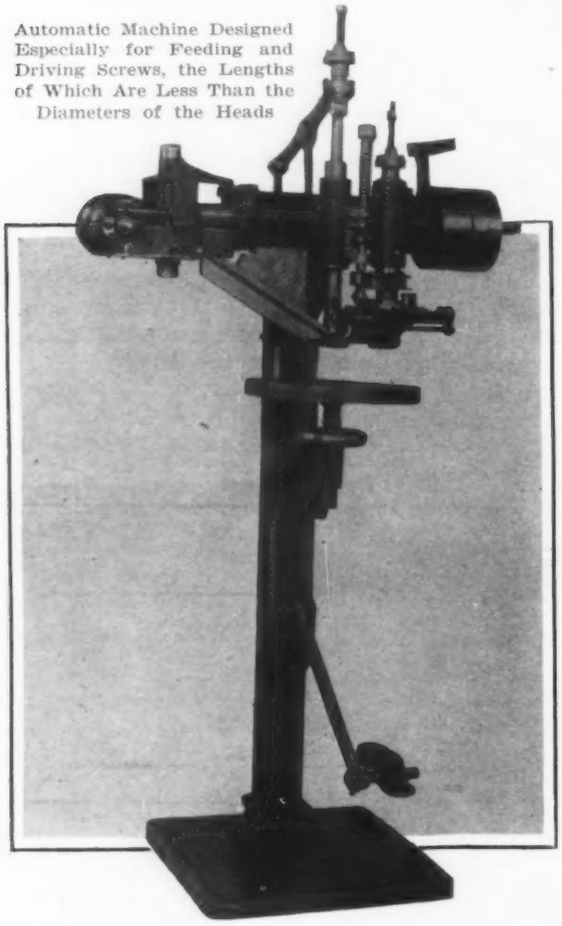
Clay Used in Foundries and Steel Plants

WASHINGTON, Nov. 1.—Figures compiled by the United States Geological Survey reveal the interesting fact that 28 per cent of the clay consumed in the United States in 1918 was used by foundries and steel works for converter and cupola linings and similar purposes. Out of a total consumption of 2,976,361 tons of clay, worth $8,332,641, 834,789 tons was consumed in this way. No valuation is given for the foundry steel works consumption, but 809,562 tons was itemized under the head of fire clay, 24,931 tons as miscellaneous clay, 290 tons as paper clay and 6 tons as ship clay. The total consumption of clay for refractory purposes in 1918 was 1,698,674 tons, or 57 per cent of the total used.

Machine for Driving Short Screws

A machine for automatically feeding and driving screws, the lengths of which are less than the diameters of the heads, is a new product of the Reynolds Machine Co., Massillon, Ohio. While designed especially for short screws, the machine also drives screws of ordinary lengths and sizes of heads.

In operation, screws are thrown at random into the magazine, which automatically arranges them in single file with heads upward and delivers them in this position into the inclined track leading from the magazine. Opposite and closing the lower end of the track is a finger recessed to receive one screw and hold it in line with the spindle.



Automatic Machine Designed Especially for Feeding and Driving Screws, the Lengths of Which Are Less Than the Diameters of the Heads

The spindle, which carries a screw driver bit, is brought down by the foot lever, the bit engaging the slot in the screw head. The finger and screw are carried downward until the point of the screw engages the work, when the finger is automatically withdrawn to allow the screw to be driven home. The spindle is adjustable and frictionally driven so that the screw driver bit stops when the screws are driven as tight as desired, or the screws can be merely started, or driven to a uniform depth.

The table is 12 in. in diameter and is adjustable on the column to take work up to 15 in. high and has screw for close adjustment. The foot lever is pivoted well above the pedal to give an easy swinging position, and can be adjusted both for position and resistance to suit the convenience of the operator. Operation of the machine by foot lever leaves both hands of the operator free to handle or assemble work. The spindle may be run several hundred revolutions per minute, thus to set the screws practically instantly. The machine is driven with tight and loose pulleys, as shown in the accompanying illustration, or with individual motor.

The Combustion Engineering Corporation, 11 Broadway, New York, has acquired control of the business of the Pulverized Fuel Equipment Corporation, formerly of 30 Church Street, New York.

Shipper Cannot Collect Switching Charge

WASHINGTON, Nov. 1.—The Interstate Commerce Commission has rendered a decision in the case involving spotting services brought by the Wharton Steel Co. against the Central Railroad Co. of New Jersey, and other roads. The decision holds the Wharton & Northern Railway Co. to be a common carrier of traffic switched and spotted for the proprietary industry. Refusal of defendants to establish and maintain joint rates, including terminal and spotting services, to and from the loading and unloading points at the Wharton Steel Co.'s plant, Wharton, N. J., and to its ore yard near Wharton Junction, N. J., or the imposing upon complainant of charges in excess of those accruing at the line-haul or junction point rates, while contemporaneously maintaining such rates, including the terminal and spotting services at competitive furnace points, are found unduly prejudicial. Claims for reparation, however, are denied.

The question involved was whether the switching service between the points of loading and unloading at the complainant's plant and the interchanging tracks of the trunk lines at Wharton is a transportation service on all proprietary traffic rather than a plant switching service. The commission, in its decision, says:

> Transportation rates generally include adequate compensation for the acceptance and delivery of traffic. It is the duty of the carriers under the line-haul rate to deliver or receive carload freight at the usual points of unloading or loading unless such points are so located that the request for the receipt and delivery at such spots could not, in view of general usage, be regarded as reasonable. The line-haul rate, however, covers only one placement of the car for loading or unloading, and an additional charge may and should be made for each additional placement for that purpose. And whether such customary and reasonable delivery is made on the ordinary team track, switch track, or plant track of an industry, it is a public transportation service.
>
> Another question for consideration is whether the Wharton is a link necessary to the completion of the transportation service or a mere device of the steel company to secure an accessorial service without payment therefor. Neither the Central nor the Lackawanna can reach the points for unloading the inbound freight without passing over some portion of the Wharton's rails. Neither can the Central reach the points within the plant where pig iron is loaded without using those rails. The distance traversed over the Wharton's rails is very short in some instances, but the factor of distance is important only in determining the amount of compensation. It would have been possible for the Lackawanna, without passing over any portion of the Wharton's rails, to have reached the loading point for pig iron over the plant tracks if such tracks had been properly maintained by the complainant, but in the absence of a refusal by the Lackawanna to perform the terminal service, it does not appear that the complainant may lawfully demand compensation out of the line-haul rate for switching pig iron shipped outbound via the Lackawanna.
>
> We find the Wharton was and is a common carrier of the steel company's traffic, subject to the interstate commerce act, and may lawfully receive from its trunk-line connections divisions of joint rates, or absorptions of switching charges under appropriate tariffs, such divisions or absorptions to be no more than reasonable. We further find that the refusal of the defendants to establish and maintain joint rates, including terminal and spotting services, to and from the unloading and loading points at the steel company's plant at Wharton, and to the ore yard near Wharton Junction, or the imposing upon complainant of charges in excess of those accruing at the line-haul or junction-point rates, while contemporaneously maintaining joint rates including the terminal and spotting services, or according the benefit of the line-haul or junction-point rates without additional charges for the terminal or spotting services at competitive eastern Pennsylvania furnace points hereinbefore named, does and for the future will subject complainant and its traffic to undue prejudice and disadvantage.

The Dominion Foundries & Steel, Ltd., Hamilton, Ont., is adding a new universal plate mill to its plant. It will be the only mill of its kind in Canada and will represent an expenditure of about $1,500,000. It will have rolls 27 in. in diameter and 72 in. long, which will roll universal plate 40 in. wide and sheared plate 66 in. wide.

Formed Milling Cutters with Spiral Teeth

Eccentric Relief Also Provided in Tools Produced by Pratt & Whitney Co.—Cutter Grinder for Sharpening Spiral Teeth

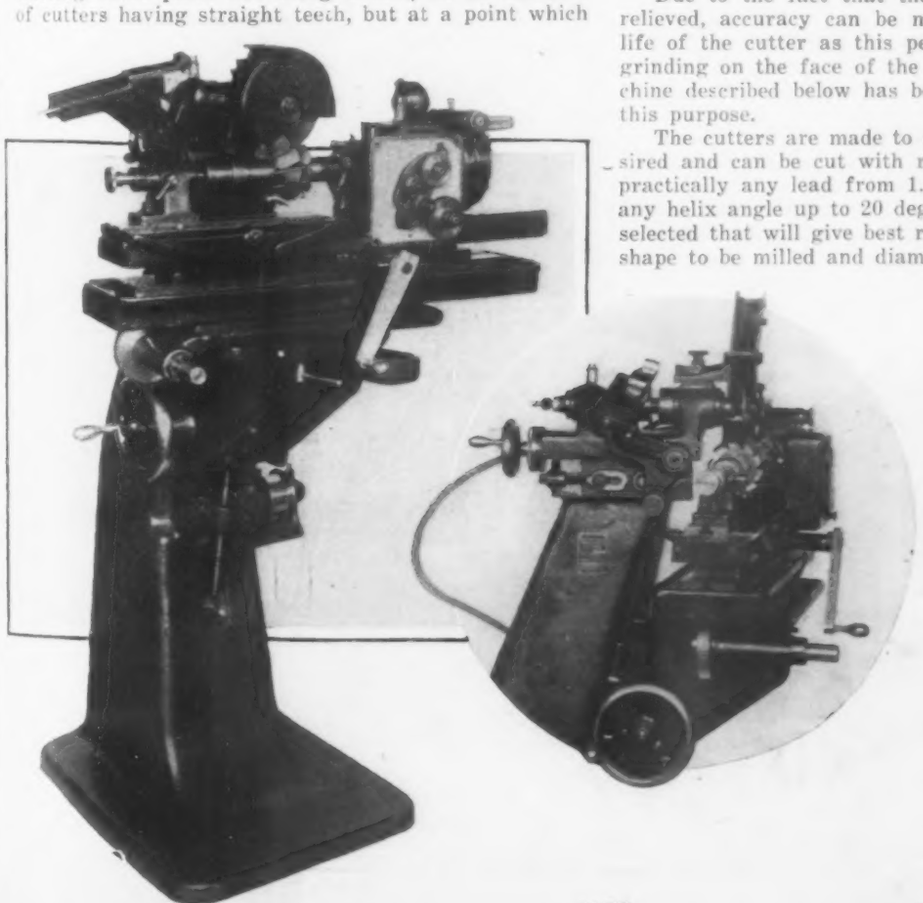
THE desirability of the spiral tooth design applied to formed milling cutters has been well appreciated, but the mechanical difficulties of the manufacture and resharpening of such cutters have heretofore prevented their use. These difficulties have been overcome by the Pratt & Whitney Co., Hartford, Conn., which is now manufacturing formed milling cutters with spiral teeth and with eccentric relief, and a cutter grinder for sharpening the cutters.

The cutters are being marketed under the trade name "Curve X." They combine the advantages of the older types of formed cutters, *i.e.* eccentric relief, free cutting qualities and accuracy, and in addition, have the advantage of spiral teeth with the smoothness of cutting and greater feeds and faster speeds this form of tooth permits. Owing to the spiral tooth design, each tooth comes into contact with the work progressively. Cutting takes place not along a line, as in the case of cutters having straight teeth, but at a point which travels in a shearing cut across the face of the work the full width of the cutter as the latter revolves. The spiral chosen is such that one tooth is entering the cut before the preceding one has cleared it; thus cutting is not only progressive, but also smooth and continuous. This permits Curve X cutters to be run at faster speeds and heavier feeds than the other types of formed milling cutters. In fact, it is explained, the limit is not fixed for what the cutter or work will stand but is controlled only by the power of the machine to drive the cutters.

Advantages are not confined to heavy cuts, it is emphasized, as light cuts on weak castings or thin pieces of sheet metal, can also be milled. For this reason the cutters are adapted for form milling light castings with projecting parts which ordinarily are apt to break if too heavy a cut is being taken.

Due to the fact that the cutters are eccentrically relieved, accuracy can be maintained throughout the life of the cutter as this permits of resharpening by grinding on the face of the tooth. The grinding machine described below has been specially designed for this purpose.

The cutters are made to order to suit the form desired and can be cut with right or left hand spirals, practically any lead from 1.607 to 125 inch and with any helix angle up to 20 degrees. A spiral is usually selected that will give best results depending upon the shape to be milled and diameter and length of cutter.



Sample Form Milling Cutters with Spiral Teeth and with Eccentric Relief Produced by the Pratt & Whitney Co. are Shown in the Illustration at the Top of This Page. Faster speeds and heavier feeds feature these cutters over the older types of formed cutters

The special cutter grinder developed for grinding form milling cutters is shown at the left. A conical grinding wheel which presents but a single line of contact between the wheel and the work at any one time makes it possible to accurately follow the helical part of the tooth

The Pratt & Whitney Co. is also manufacturing spiral fluted hobs, similar in design to the Curve X cutters, for milling roll threading dies. These hobs can be readily sharpened with the Curve X cutter grinder.

Cutter Grinder for Curve X Cutters

The cutter grinder while designed for grinding Curve X cutters, can be used for grinding all types of milling cutters and hobs with straight cut teeth. It is also adapted for grinding fluted reamers and similar tools.

The machine is equipped with a conical grinding wheel which presents but a single line of contact between the wheel and the work at any one time. The wheel, therefore, is able accurately to follow the helical path of the tooth and to grind the cutting edge to the form required. This is accomplished by imparting a combined traverse and rotary movement to the cutter. The table on which the cutter is mounted can be swiveled horizontally about an axis which intersects the axis of the spindle and grinding wheel. When grinding Curve X cutters this table is swiveled at an angle to correspond to the helix angle of the cutter teeth. It is then reciprocated in the usual way by handle operated rack and pinion. At the same time a reciprocal rotary movement is imparted to the cutter through a set of change gears selected to conform to the lead of the cutter.

Two other features are explained as insuring the precision required for grinding formed milling cutters with spiral teeth. The first is an indexing device for successively bringing the teeth in line for grinding instead of holding the back of the tooth against a spring stop. The other consists in the fact that cutters of different sizes can be ground radially without resetting the head or table. The machine is so designed that regardless of diameter of the cutter or wear of wheel, the grinding line is always radial; that is, on a line with the center of the cutter.

The surface of the grinding wheel is kept dressed to the correct shape by means of an accurately mounted diamond. Provision is further made for adjusting this diamond from time to time in such a manner as to maintain the true cone angle of the grinding wheel.

In order to simplify setting up the machine, each Curve X cutter has stamped on one end the helix angle and also the lead in inches of the helix. Another feature is the arrangement of the machine for wet grinding rather than dry grinding.

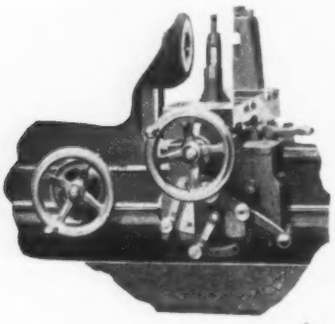
Geared Head Turret Lathe With 12 Spindle Speeds

A new geared head turret lathe with 12 spindle speeds and 6 power cross feeds is announced by the Warner & Swasey Co., Cleveland. It is a development of the company's standard turret lathe, but is designed for greater power and a range of feeds and speeds sufficient to embrace those necessary for machining the many different metals in use to-day and to include facing, forming and cutting-off operations on all diameters within the capacity of the machine. The geared head construction employed, it is stated, delivers four times the power of the ordinary geared friction head of the same size machine and double the power of the double friction back geared type. In spite of the increased power, however, it is explained, less effort is required to move the controlling levers.

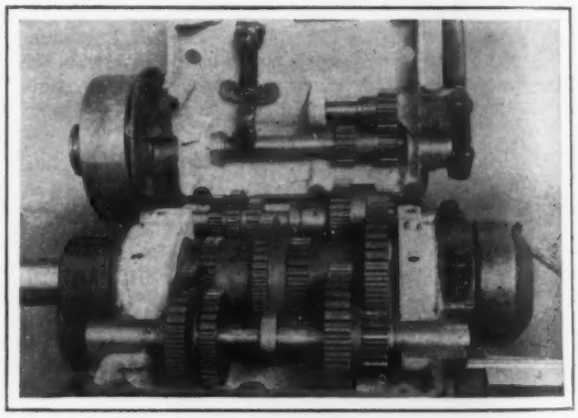
The lathe is manufactured in two sizes, known as Nos. 4 and 6, with maximum capacities as follows:

	No. 4	No. 6
	In.	In.
Round bar stock, diameter	1½	2¼
Length turned	10	12
Swing over bed	16	20⅜
Swing over cross slide	7	9¼

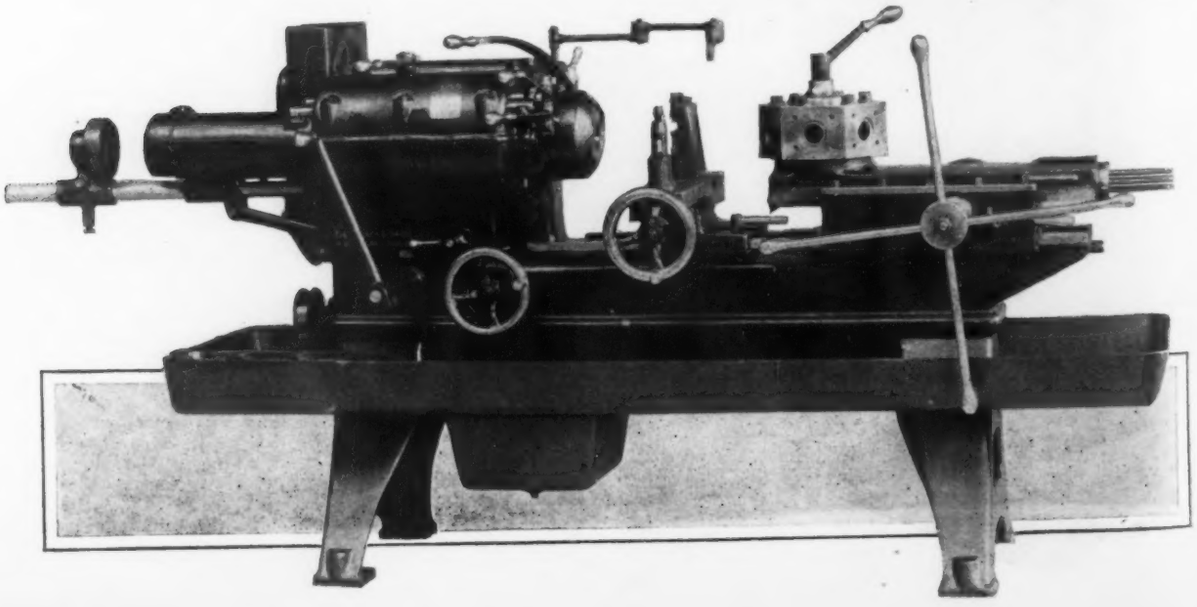
The geared head consists of steel gears of coarse pitch and wide face, running in oil. The oil bath also



Twelve Spindle Speeds and Six Power Cross Feeds Are Provided in New Warner & Swasey Turret Lathe Shown Below.



The gearing in the head of the No. 6 lathe is shown at the right, and the heavy duty carriage at the left



lubricates the bearings. Two gear sets are mounted on the front shaft, while the third set and the reverse friction clutch are mounted on the back shaft, thus providing the 12 spindle speeds and reverse. Another advantage of the geared head construction emphasized is its adaptability to the various types of motor drive—either geared directly to the motor, chain drive, or belt drive with idler to driving shaft.

The No. 6 turret lathe can be equipped with the company's standard type cut-off or with a new heavy duty carriage, the latter being especially valuable for heavy cuts and heavy forming operations. The range of six power cross feeds provides for all facing, forming and cutting-off speeds. A square turret to carry four cutters may be substituted for the front tool post. The No. 4 turret lathes are being equipped with the company's standard No. 4 cut-off.

The turrets on these machines are the same as have been furnished on the standard No. 6 turret lathes and can be equipped with power feed having four changes.

MECHANICAL PUDDLING

Plans for Erection of Plant at Warren, Ohio, to Use Ford Process

Plans for erection of a mechanical puddling plant at Warren, Ohio, by the Youngstown Steel Co., E. L. Ford president, are being developed following an extensive and prolonged period of experimentation. Initial installation will consist of four puddle furnaces with tonnage capacity of 275 tons per 24 hours, with rolling equipment. Semi-finished material will be produced in form of billets, slabs and bars, though no sheet bars will be manufactured. Hot metal will be supplied from cupolas. The projected layout calls for 16 puddling furnaces, with a daily output of 1000 tons, and two blast furnaces. An experimental plant consisting of one furnace and auxiliary equipment, which has been maintained for several years at the Brier Hill Steel Co.'s property in Youngstown, Ohio, will be moved to the site of the proposed works.

The process is covered by patents. It is the purpose of the promoters not only to sell puddled iron on the market, but to sell the puddling machine as well. E. L. Ford, the inventor, has been identified with manufacturing interests of the Mahoning Valley for many years, being a director and member of the executive committee of the Brier Hill Steel Co. and heavily interested in the Youngstown Sheet & Tube Co. One of the successful features of the invention is the method of removal of the puddled iron ball from the furnace after the puddling process is completed.

Iron produced at the experimental plant has been worked on rolling mills of the Republic Iron & Steel Co., A. M. Byers Co., Youngstown Sheet & Tube Co., Brier Hill Steel Co. and others, has been subjected to severe tests, and according to the inventor has proven satisfactory.

Associated with Mr. Ford in his experimentation work is T. M. Phillips, first vice-president and general manager of the Youngstown Steel Co., and H. C. Bixler, vice-president and engineer, formerly in the engineering department of the Brier Hill company. J. P. Suter is secretary and treasurer.

Interests closely identified with the Brier Hill Steel Co. are associated with the new project. A 480-acre site along the Mahoning river immediately west of Warren has been acquired and construction will begin next spring. Initial installation will involve expenditure of $1,800,000.

It is claimed mechanical puddling will produce iron at a lower cost and of higher quality than hand-puddled iron.

The Youngstown Steel Co. has been in existence for many years and at one time owned Tod furnace of the Brier Hill Steel Co. Its present holdings consist of realty and coal lands.

Railroad Financing Approved

WASHINGTON, Nov. 1.—Purchase of new equipment by five different railroads is made possible by authority granted by the Interstate Commerce Commission. A loan of $6,000,000 to the Northern Pacific Railway Co. from the $300,000,000 revolving fund was approved by the commission. Issuance of securities was approved in the case of the New York, New Haven & Hartford Railroad Co.; the Illinois Central Railroad Co.; the Chicago, Indianapolis & Louisville Railway Co., and the Chicago, St. Paul, Minneapolis & Omaha Railway Co.

The Northern Pacific is planning to buy locomotives and freight cars and to make additions and betterments to existing equipment and to way and structures at a total estimated cost of $16,000,000. The road is required to finance about $10,000,000 to meet the loan of the Government.

The New York, New Haven & Hartford was granted permission to issue $2,000,000 of 7 per cent promissory notes, and to issue $3,500,000 of equipment trust notes.

More Members of Engineering Federation

Two additional members of the Federated American Engineering Societies are announced. The Kansas Engineering Society, by letter ballot, has voted to become a charter-member and has named Lloyd B. Smith as the delegate to represent the society at the first meeting of American Engineering Council Nov. 18 and 19 in Washington. The Alabama Technical Council at its regular meeting on Oct. 1, voted also to become a charter-member.

Purpose of the Federation

The kind of activities in which the new organization of societies can engage in are in part as follows:

National public works department movement
Super-power project
Co-operation with the drafting Bureau of Congress in its work of preparing for a national budget system
Building legislation for the licensing or registration of engineers
Ways and means (now under consideration) for the conservation of national resources, coal, oil, etc.
Transportation problems
Industrial relations between capital and labor

The object of the organization is to bring about the solidarity of the engineering and allied technical professions, which include 100,000 to 200,000 engineers. It is to further the public welfare wherever technical knowledge and engineering experience are involved and to consider and act upon matters of common concern to the engineering and allied technical professions.

The American Institute of Electrical Engineers has appointed its representatives on the American Engineering Council.

Bethlehem Steel Orders

The value of orders on the books of the Bethlehem Steel Corporation at the end of September was $195,500,000, compared with $251,400,000 at the beginning of the year, according to a statement by Eugene G. Grace, president, who said that the completion of work on ships for the United States Navy & Emergency Fleet Corporation accounted for practically all the reduction of orders.

Mr. Grace reported the steel plants of the corporation now operating at about 80 per cent of capacity, a decrease of 10 per cent compared with September, and due solely to the falling off in new business. In giving out the value of the orders as of Sept. 30 the Bethlehem company inaugurated a new departure, as these figures in the past have been incorporated in the annual reports.

Directors declared the regular quarterly dividend of 1¼ per cent on both classes of common stock, payable Jan. 3, 1921, to stockholders of record on Dec. 15 next.

Vertical Spindle Grinding Machine

A new grinding machine known as No. 142 has been added to its line of grinding machinery by the Badger Tool Co., Beloit, Wis. It is of the vertical spindle type, that is, the disk 42 in. in diameter travels in a horizontal plane at 600 r.p.m. The work to be ground is placed on top of the disk and suitable cross bars or stops prevent the piece from traveling with the wheel. The weight of the piece itself or auxiliary weights provide pressure against the grinding disk.

A dust channel completely surrounds the outside of the wheel and is accessible by removing the top guard ring. The vertical motor is force ventilated and has provision for lubrication and complete exhaustion of the dust. The spindle is mounted in radial and thrust ball bearings.

The grinder is built in the motor driven type only and because of this construction requires a small floor space and can be operated from any position, there

The Motor-Driven Spindle Carries a Grinding Disk 42 In. in Diameter on Which the Work Is Placed

being no obstructions to interfere with working on all sides of the machine. A 15-hp. motor is used at 600 r.p.m. The equipment includes a 42-in. steel disk wheel, dust exhaust system, an improved type of wheel press, oil compensator, an assortment of abrasive disks and the regular assortment of supplies. The total weight is 3000 lb.

Pere Marquette Reconstruction

DETROIT, Nov. 1.—The Pere Marquette Railway Co. is pushing its post-war reconstruction program rapidly, and already much work has been completed. One hundred miles of 90-lb. rails have been laid, and 175 more will be laid beginning early next spring. All would have been laid this year, had it not been for slow deliveries from the mills. The American Locomotive Works is now constructing 12 Pacific-type passenger locomotives, and delivery is expected Dec. 1. Twelve all-steel passenger coaches and 12 all-steel baggage and express cars are being built, and delivery is expected early next year. Other portions of the $5,782,000 reconstruction program, including round houses, machine shops, turn tables, coal docks, bridges and freight yards, are being pushed.

Decrease in Car Shortage

WASHINGTON, Nov. 1.—Reports compiled by the Car Service Division of the American Railway Association show a marked reduction in the shortage of freight cars in relation to the requirements of shippers although the volume of freight traffic has continued to increase.

The average daily shortage of freight cars as compared with the orders placed by shippers for the week ending Oct. 8 was 75,336. Of this total 36,361 were box cars and 25,914 coal cars. The total for the previous week was 80,141. The number of cars loaded with commercial freight during the week ended Oct. 9 totaled 1,009,787, which was greater than in any previous week and has been exceeded but once in railroad history.

There was an average daily shortage of freight cars of from 70,000 to 80,000 during the first two months of 1920. This shortage was increased following the strike largely as a result of congestion of freight at terminals. The average on Sept. 1 was 146,070. Since that time there has been a steady decrease. The congestion that has prevailed during the early part of the year has been almost entirely cleared.

Large Steel Tonnage for Vancouver Pier

SEATTLE, WASH., Oct. 27.—Inquiries for the steel for the projected Ballantyne pier, to be built at Vancouver, B. C., by the Canadian Government, are now in the market. The Northern Construction Co. of Vancouver is the low bidder on this pier, which it is estimated will cost $6,000,000 and require two years to build. From 6500 to 7000 tons of steel will be used. Inquiries now being figured on by Canadian steel mills, as well as American mills, include about 5000 tons of ¼-in. to 1¼-in. round reinforcing steel bars, 300 tons of 1-in. to 1¼-in. plain and twisted squares, 500 tons of screw-up bolts, sleeve nuts, washers and cutting edge angles, and about 100 tons of small structural shapes. For the permanent ways on the pier there will be needed 300 tons of 85-lb. rails and 60 tons of 90-lb. In addition there are material for 12 turnouts, manganese steel frogs and a switch stand.

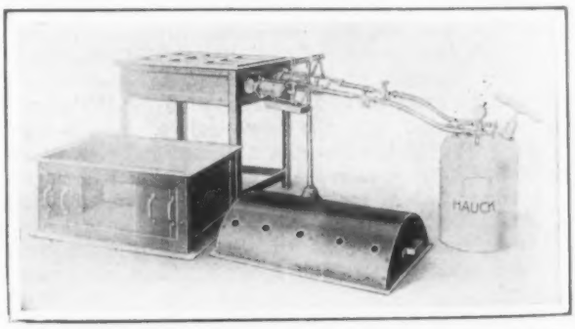
An Eastern steel mill, through its Seattle, Wash., representatives, is now completing shipments of about 300 tons of 28-gage galvanized sheets to Manila, P. I., sold some time ago on the basis of 8.25c. and 8.50c. at mill. There has been no new inquiry for sheets from Manila for some time.

Preheating Furnace for Welding

A furnace for preheating work preparatory to welding has been developed by the Hauck Mfg. Co., 126 Tenth Street, Brooklyn, N. Y. It consists of a deep box or oven, with detachable cover, mounted on a preheating table. The box is large enough to accommodate a block of six cylinders and other small parts at the same time. Three sliding doors enable the operator to watch the work and see that it is not overheated.

The box is lined with asbestos, which retains the heat, and the oven can be used for reheating after welding. The burners can then be turned off and the castings allowed to cool gradually.

By removing the box and cover the furnace is converted into a preheating table. The combustion chambers through which the flames of the kerosene preheat-



Hauck Kerosene-Fired Furnace for Preheating Work Preparatory to Welding

ing burners travel, are lined with a patented type of refractory brick, which breaks the flame up into a number of small radiating flames. This is emphasized as an important item in evenly and thoroughly transmitting the heat to the castings or broken machine parts to be heated.

The furnace has been found valuable for such work as welding gears, crank-cases and other parts with comparatively large areas and of intricate formation. The even heating prevents cracking and avoids unequal expansion.

New Open Shop Movement in Cleveland

American Plan Association Will Lead in Improving Industrial Conditions—Chamber of Commerce Also Active—News of the Labor World

TO make Cleveland an open shop city is the object of an organization known as the American Plan Association that was recently organized in that city. Before definitely effecting an organization, the promoters of the plan made a rather thorough canvass of the employers in Cleveland, and owing to the strong sentiment prevailing in favor of the open shop soon secured enough pledges to insure a strong association at the start.

While its membership is largely confined to the metal working industry, which is the predominating industry in Cleveland, the organization will take in all classes of employers, and its aim is eventually to enroll as a member every employer of labor in Cleveland and in Cuyahoga County, in which Cleveland is located. At present its membership includes 70 per cent of the employers in the district, comprising both the city and county, and these employers employ 85 per cent of the labor in the district. Nearly all the large employers of labor in the metal working field are affiliated as members. The object and scope of the association are outlined in the following statement that has just been made public by the authority of the association:

Principles of Association

"The principles of the association are to secure and perpetuate for employers and employees freedom of contract, irrespective of religious, political, industrial or labor organization; to perpetuate justice and liberty for all who live within our community, and to uphold the right under the Constitution of the United States of every individual in the enjoyment of life, liberty and property.

"The principles are subscribed to by all who become members of the association. The American Plan Association undertakes to secure to all workers in industry the same rights and privileges that are guaranteed to them by the Constitution of the United States.

"The broad American principles can be established in industry by the open-shop policy, for in an open shop the constitutional rights of the individual are neither abridged or denied. The open shop is not a counterpart of the closed shop, but is a direct contrast to the two forms of closed shop. The closed non-union shop, where no man with a union card can get a job, and the closed union shop, where no one without a union card can get a job, are equally negative in their effect, while the open shop offers to the employer and employee alike that freedom of action that will develop the progressive spirit and enrich the community in which the industries are located.

"The American Plan Association is for the open shop because it takes into consideration the three elements that are involved in the relationship of any community problem, i. e., the employer, the employee and the general public.

"The American Plan Association wishes to see Cleveland a thoroughly open shop city, so that efficient workmen will be attracted because it is a good place in which to live and work and that capital will be invited here to invest, and, together, these two elements will create that healthy business condition for Cleveland that means industrial peace and therefore prosperity to the whole community.

"The American Plan Association is a comprehensive organization in that it includes in its membership those elements of the community that are working constructively for the interests of the community and by harmonious action and co-operation of effort will bring to Cleveland the reputation of carrying out in practice as well as theory the principles in the Constitution of the United States."

The new association will work closely with the National Metal Trades Association and other national associations that have the open shop as one of their fundamental principles, many of those affiliated with the new association being members of other organizations. Temporary offices have been opened at 331 Statler Hotel.

Chamber of Commerce Activity

The Cleveland Chamber of Commerce is now taking an active hand in the open shop movement in that city. The closed shop has long existed in the building trades in Cleveland, and for some time a committee of the Chamber of Commerce has been conducting an investigation of the abnormal cost of building and the consequent curtailment of building operations in Cleveland. This committee, which has just made its report, found that the existence of the closed shop in Cleveland has been responsible for limited production, for keeping building trade labor out of Cleveland, that special agreements between contractors and contractors' associations and building trades unions resulted in a dictation by the unions as to hours, wages, etc., that a three year no-strike agreement between the Building Trades Employers' Association and the Building Trades Council did not prevent a number of long strikes and that building labor costs in Cleveland were higher the past summer than in any other of the other cities investigated except Chicago.

Higher Wages for Iron Workers

For the November-December period puddlers will be paid $18.76 per ton, an advance from $18.02, as a result of the bi-monthly examination of sales sheets conducted Oct. 29 at Youngstown, Ohio, between representatives of the Western Bar Iron Association and the Amalgamated Association of Iron, Steel and Tin Workers. The settlement is based on the Western scale of prices governing wages in rolling mills.

Average sales price of bar iron on shipments for the 60-day period ending Oct. 20 was found to be 3.55c. per lb., as compared with 3.40c. at the preceding settlement, an advance of three points. This card rate establishes a new high puddling rate for the industry. Wages of bar iron finishers are advanced 7½ per cent. The average card is the highest in the past three years.

In 1920 the card has carried as follows: January-February, 2.55c.; March-April, 2.70c.; May-June, 3.00c.; July-August, 3.25c.; September-October, 3.40c, and November-December, 3.55c.

James H. Nutt acted for the manufacturers and M. F. Tighe, Pittsburgh, president of the Amalgamated Association, for the employees.

General Electric Stock Subscription

The plan of stock offering to employees of the General Electric Co., under authority conferred by the shareholders at a special meeting held on Oct. 14, provides that any employee of the company who, on Nov. 1, 1920, shall have been on its payroll continuously since Sept. 1, 1920, is offered the privilege of subscribing for one to ten shares of its capital stock at the price of $136 per share. There will be a credit, amounting to $20 per share, against the subscription price, which will represent a net return substantially the same as that which would be enjoyed by anyone purchasing stock on an installment plan, paying interest on deferred installments and receiving cash and stock dividends. Certificates of stock shall be issued to the subscribers only when payments, including any other credits, amounting to $116 per share shall have been made as hereinafter described.

Subscriptions may be made during the month of

November, 1920, upon forms furnished for the purpose and shall be turned into the office of the branch where the subscriber is employed.

If the number of shares subscribed for shall exceed the number of shares available for subscription, the company reserves the right to reduce any or all subscriptions in excess of one share.

Payments shall be made by deductions from salary or wages, in monthly or weekly installments. Monthly deductions will begin with the month of December, 1920, and weekly deductions with the payroll of Jan. 28, 1921. Except as they may be reduced in number by the equivalent of rights or other credits, payments shall be made in 29 monthly installments of $4 for each share subscribed for, or in 116 weekly installments of $1 for each share subscribed for. *Payments of subscriptions may not be made in advance.*

The following table illustrates the number and amount of installments to be paid:

No. of Shares	Monthly Payments: Per Month	Monthly Payments: Total 29 Months	Weekly Payments: Per Week	Weekly Payments: Total 116 Weeks
1	$4	$116	$1	$116
2	8	232	2	232
3	12	348	3	348
4	16	464	4	464
5	20	580	5	580
6	24	696	6	696
7	28	812	7	812
8	32	928	8	928
9	36	1044	9	1044
10	40	1160	10	1160

Upon payment of the final installment, the company will issue to the subscribers, as soon as practicable, certificates for the number of shares to which they may be entitled. *No earlier or partial deliveries of stock will be made.*

Subscriptions shall be made upon the condition that all questions arising under this plan shall be decided by the board of directors of the General Electric Co., and such decision shall be final and conclusive upon all parties.

When for any reason a subscriber ceases to be an employee of the company before his payments hereunder are completed, his subscription will thereupon be cancelled and the total amount paid by him by deduction from salary or wages, plus interest at the rate of 7 per cent per annum, will be refunded.

The company states that "Employees are under no obligation whatever to make subscription in accordance with this plan. The purpose of this offering, made in response to a widely expressed desire, is to give employees an opportunity to buy stock upon easy terms of payment."

Youngstown Employees Subscribe for Stock

Coincident with oversubscription of an offering of common stock by employees of the Trumbull Steel Co., Warren, Ohio, is the announcement of a similar offering by the Youngstown Sheet & Tube Co., Youngstown, Ohio. This is the first time independents in the Youngstown district have offered stock to their workers. Of the 5000 employees of the Trumbull Steel Co., approximately 2000 entered subscriptions for common at $27.50 per share, payments to be deducted monthly from subscribing employees' wages. The Trumbull company set aside 80,000 shares of $2,000,000 par value common for its workers.

On authority of stockholders, directors of the Sheet & Tube company reserved 100,000 shares of non-par value common for sale to employees. One-fifth of this amount, or 20,000 shares, is to be offered each year for five years. The price for the first year will be $85 per share, to be paid in instalments of $7 per month per share. The number of shares that may be purchased by one employee is limited, the maximum being determined by wages or salary earned, and this maximum being subject to reduction pro rata should the amount set aside for any year be oversubscribed. The largest number of shares for which any employee may subscribe is indicated by the following schedule—$2000 or less, 5 shares; $2001 to $2500, 6 shares; $2501 to $3000, 7 shares, $3001 to $3500, 8 shares; $3501 to $4000, 9 shares; $4001 to $4500, 10 shares. Employees whose earnings exceed $4500 per year will be entitled to subscribe for stock according to this schedule, with one share added for each $500 above this amount, but in no case will any employee be allowed more than 20 shares, under this plan.

No cash payment will be required, but $7 per share will be deducted from the wages or salary of the subscriber each month for each share, and this will be credited on his subscription, with all dividends accruing. In cases where wages are paid semi-monthly, $3.50 per share will be deducted from each pay. Interest at the rate of 5 per cent will be charged on deferred payments, but in no case may the interest charged exceed the dividend credited. The first deduction will be from the first pay in January, 1921. The plan provides for full payment of the stock during the year and employees will be entitled to certain special benefits.

Must Not Depend Upon Europe

HARRISBURG, PA., Nov. 1.—Foreign countries can no longer be depended on to send skilled workers, including those in the metal trades, to the United States, according to Dr. Clifford B. Connelley, commissioner of labor and industry of Pennsylvania.

"The future supply of expert workmen of every kind for the United States must be developed in this country. Europe is going to need all of its skilled men and all it can train," Dr. Connelley said in his statement, which called attention to the fact that the greatest need not only of Pennsylvania, but of the United States, is greater production, collective and individual.

"It is absurd now," insisted Commissioner Connelley, "to expect tool makers and molders from abroad. There is so great a demand for able-bodied mechanics and artisans of all kinds in every country of Europe that the United States need not for many years expect any immigration of skilled workers from that source. The future supply of expert workmen of every kind must be developed in this country and need not be hoped for from Europe.

"The present situation is a very serious situation, which must be solved very soon by the manufacturers and by the workmen, if necessary production is to be maintained or increased."

Machinists Must Sign Agreement

SAN FRANCISCO, Oct. 30.—Abandoning its former idea of locking out all union machinists because of their refusal to handle work for the American Can Co., against which the International Association of Machinists has placed a national boycott, the California Metal Trades Association has modified its stand by deciding that all machinists in employ of member shops must sign a statement agreeing to perform without discrimination all work assigned to them as machinists.

All machinists refusing to sign will be discharged and men applying for work will be required to agree to the aforementioned policy, according to announcement of the association of employers. A general shutdown of machine shops and foundries in the San Francisco Bay district had been threatened as a result of the recent trouble.

At a conference of officers and department heads of the Bullard Machine Tool Co., Bridgeport, Conn., on Oct. 22, it was decided to extend the period of shut-down two more weeks. The factory closed on Oct. 11, throwing 1000 employees out of work. Continued depression in the machine tool trade is the reason for the extension.

Over 2500 employees of the New Departure Mfg. Co., Bristol, Conn., have been laid off because of poor business in the automobile and machinery industries. An official article in the plant publication states: "It is interesting to note how manufacturers and users of machinery employed in industry are equipping their machines with ball bearings. The number was growing larger month by month until the temporary depression hit in. This over, the time is not far distant

when all good machinery will be mounted on anti-friction bearings, most of them of the ball type."

Thirty employees of the foundry of the J. B. Prescott & Son's, Webster, Mass., makers of blacksmith's machinery, went out on strike on Oct. 26 when they were notified that they would have to accept a 15 per cent reduction in wages. The management claimed that the reduction was imperative to keep the business going. Their pay has ranged from $16 a week for apprentices to $40 per week for the most highly skilled. Some of the men returned to work later.

The Insurance Federation of the State of New York is taking an active interest in arousing workingmen to a realization of the dangerous elements at work in the nation, and is presenting the subject of Americanization to employees at the noon hour or other convenient time. The Federation is offering the services of its secretary, Stanley L. Otis, as a speaker, without expense, to those who engage him. Mr. Otis's address is 47 Maiden Lane, Albany, N. Y.

Reconsignment Rule Interpreted

WASHINGTON, Nov. 1.—In a decision on the formal complaint of the Boston Chamber of Commerce, acting for shippers and receivers of freight in eastern Massachusetts, against the Grand Trunk of Canada and other railroads, recently made, the Interstate Commerce Commission made an interpretation of the reconsignment rule as it relates to "order-notify shipments," which, it is believed, will be of more than ordinary interest to shippers of iron and steel articles.

Order-notify bills of lading need not be surrendered permanently as a condition precedent to the acceptance of an instruction to change the bill of lading so that Smith, for instance, instead of Jones, will receive the carload of relaying rails or scrap iron covered by it.

Under the commission's decision, in what is known as the reconsignment and diversion case, the railroads filed tariffs which they interpreted to mean that the holder of an order-notify bill of lading would have to surrender it before they would honor an order from the holder to send the car to a consignee other than the one mentioned in the bill of lading, and also that when such a reconsignment order was accepted, $7 per car would be exacted as the price for such service.

In the case of what is known as the straight bill of lading, such reconsignment service would be rendered if requested within the free time allowed for unloading without extra charge. The only difference in the two services was the form of the bill of lading.

In the recent Boston Chamber of Commerce decision, Commissioner Meyer, discussing the surrender of order-notify bills of lading, said:

"The tariffs require as a condition, on shipments consigned 'to order,' that the original bill of lading be surrendered, or that, in its absence, satisfactory bond of indemnity or other approved security be given at the time the order of diversion or reconsignment is placed

"This rule has been construed in at least one instance as requiring the complete and permanent surrender of the bill of lading. Defendants admit that presentation or temporary surrender of the original bill for indorsement thereon of the reconsignment instructions is all that should be required. With such amendment complainants will be satisfied, and we find that the rule should be amended accordingly."

Low Bids on Hog Island

WASHINGTON, Nov. 1—Opening of bids by the Shipping Board for the shipbuilding plant at Hog Island brought only two offers, both of which were rejected because they were too low. One was from the Barde Steel Corporation and was for $4,000,000, while the other was from the New Jersey Machinery Exchange and was for $4,268,750.

The Barde company already has a contract for the purchase of surplus steel at the steel ship yards. It is understood that the company planned to wreck the Hog Island plant and dispose of the materials.

The Government's investment in the Hog Island plant totals $69,000,000. The board had hoped to get as much as $20,000,000 from it.

MANAGEMENT EDUCATION

Plan to Provide Courses in 620 American Colleges

A course in "management education" to provide a sufficient number of properly trained executives for the industries of the United States is to be established in a majority of the 620 American colleges, according to an announcement made to the Associated Press by Dr. Hollis Godfrey, president Drexel Institute, Philadelphia.

An annual appropriation of $100,000, entirely borne by American industry, has been made to carry on the work, which has been divided into two classes: First, to determine the field of service which each college can cover, and, second, to provide the college with all industrial data which may be utilized in forming undergraduate courses for men contemplating entering industry and in reaching the management men already in industry through extension courses.

All of the courses and scholastic recommendations, it was said, will be passed upon jointly by the Council of Management Education and the American Council on Education before being forwarded to the institutions of learning. Within one year, it is estimated, 100 colleges will have included the extension industrial courses and all will be provided with the industrial material upon which to base undergraduate work.

The council, according to Dr. Godfrey, is the only war organization which has carried operations into time of peace. Nearly all of the educators back of the movement served in the Council of National Defense. When the armistice was signed these men decided that the educational knowledge gained during the war at an expenditure of millions of dollars should not be lost. Accordingly, plans were set in motion to turn this information over to industry. A survey of the needs of industry was made under the auspices of the Technology Clubs Associated of the Massachusetts Institute of Technology.

In the most extensive industrial survey ever made, executives of 250 of the largest corporations in America agreed that increased production, decreased cost, increased stability and increased incentive were the most important needs. The convention in Philadelphia last spring met to discuss these needs. It was agreed by both college presidents and executives of America's industries that the needs of industry can be met only through proper education, and plans were made for the formation of the permanent council for management education.

While the majority of American industries are represented on the council, those having members on the executive committee are the railroads, public utilities, oil, textiles, mining, rubber, leather and shoes, paper, machinery and cotton finishing.

The executive members of the council appointed to represent their industrial group include the following: Railroads, A. W. Gibbs, chief mechanical engineer, Pennsylvania Railroad; mining, J. Parke Channing, mining engineer; machinery and metals, Frederick H. Payne, Greenfield Tap & Die Corporation.

Reports on Mineral Products

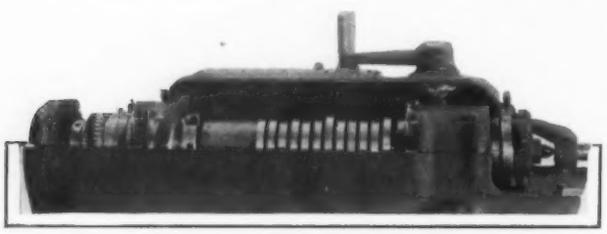
WASHINGTON, Nov. 1.—The United States Geological Survey has issued the final tables on the mineral products of the United States, by minerals and by states, for 1917. This document is of particular value to all students of mineral statistics, although the preliminary figures have previously been published. It may be obtained by direct application to the Geological Survey.

In the same way the Survey has published two reports describing manganese products in Colorado and Wyoming. These reports are the result of examinations made during 1917 and 1918 to determine the possibilities of increasing the domestic output of manganese. The Wyoming report covers the only manganese found in that State in 1918. The other report describes seven deposits found in Colorado.

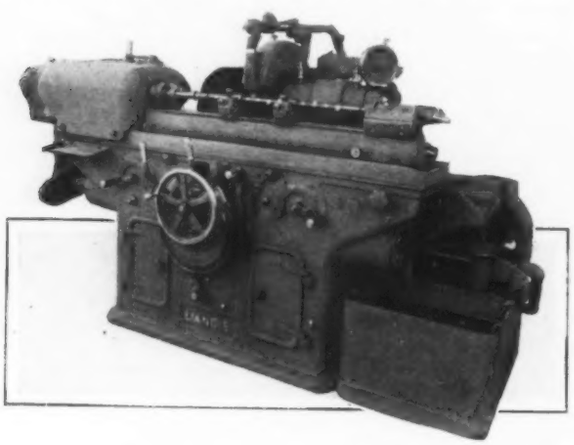
Cam Grinding Attachment

In designing cams of various shapes for automobile crankshafts, the tolerance has gradually been reduced so that grinding machines are called upon to produce many difficult shapes, to meet the requirements of accuracy. In order to obtain a silent cam, clearances have been reduced and at the opening and closing points in some cases there is a slight rise in a number of degrees; for example, 0.005 in. in from 20 to 25 degrees. To provide for these requirements a new attachment for use in a cam grinding machine has been developed by the Landis Tool Co., Waynesboro, Pa. One of the accompanying illustrations shows the attachment mounted on the Landis 10-in. plain self-contained machine.

The outstanding features of the new underslung cam grinding attachment as explained by the manu-



Landis Attachment Designed to Provide for Exacting Requirements of Modern Cam Grinding. It is shown below mounted on Landis 10-in. plain self-contained machine



facturer are as follows: The swing bracket is tubular in the cross section and is well supported directly under the master cam and work centers close to the machine bed. This construction balances the swinging bracket, eliminating all strain. The work being carried directly over the fulcrum center, reduces the vertical movement and grinding contact from changing over the periphery of the wheel, thus cutting down to a minimum the difference in contour of cams caused by the changing diameter of the grinding wheel. The master cam being mounted directly on the headstock spindle, substantially connected and in line with the work, eliminates lost motion and errors. The master cam is kept in contact with the master cam roller by means of compression springs, the tension being adjustable to suit different conditions.

It is pointed out that accurate work is secured when the grinding wheel is of a diameter equal to that of the roller used in contact with the model cam when generating the master. This condition is caused by the contact between the work and grinding wheel, traveling above and below the wheel center. The more the grinding contact varies from the wheel center, the more pronounced the variation in the contour of the cams ground with different size wheels. Due to the work being swung an equal distance from a point directly over the fulcrum center, the movement of the work is practically in a horizontal plane, reducing to a minimum the travel of the grinding contact above and below the wheel center.

Praise for Lupton Company's Working Conditions

Richard Spillane, in an article in the Philadelphia *Public Ledger*, under the title "Men and Business," paid a tribute to the working conditions he had observed in the plant of the David Lupton Sons Co. in the Kensington district of Philadelphia. The text of Mr. Spillane's editorial was "Atmosphere," which has been defined as "the surrounding or pervading influence." Mr. Spillane said in part:

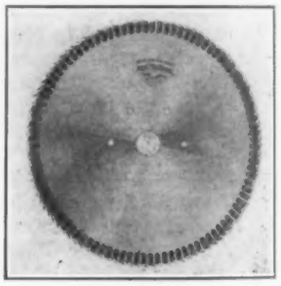
"Some day employers will have a better understanding of the monetary value of the proper 'atmosphere' than they have to-day. Men work well where the atmosphere is right. They do not where the atmosphere is wrong.

"The Lupton shop covers acres. There wasn't a nook or cranny of it that wasn't as light and bright as an open field on a sunny day. As the boss went along from building to building it was 'Hello, Bill,' or 'Joe,' or 'Pete,' or 'Jake' here and there. Some he didn't know by name, but not many of the middle-aged or more matured. Now and then he remarked that this one or that one had been with the concern 15, 20, 25 or 30 or 35 years. The floors were remarkably clean, the roofs were remarkably high. The Pond system of ventilation kept the air as pure as it is outdoors, almost."

Mr. Spillane then went on to describe a meeting of the shop council of the establishment; how a "bald-headed old boy in working garb" presided. "The boss spoke. The newspaper man spoke. Everybody smoked and the men went back to their jobs. There's democracy in that plant. The officers meet the men and talk to them man-fashion. The employees meet the management and talk to them man-fashion and there are no strikes."

Inserted Fine Tooth Metal Saw

An inserted tooth metal saw designed to cut structural steel, I-beams, channels, and stock with thin walls, has been developed by the Simonds Mfg. Co., Fitchburg, Mass. The pitch or spacing of the teeth is sufficiently fine to keep two teeth in the cut at all times, thus to provide smoother running and eliminate chatter. It is a fast-cutting saw, and is fitted with as many teeth as it is possible to securely fasten into the plate with the Simonds method, and at the same time retain necessary alignment of teeth and strength of plate.



Fast Cutting Saw for Structural Material. The inserted teeth are spaced so closely that two teeth are in the cut at all times.

Saws are made from 10 in. diameter with kerf of ¼ in., and maximum of 40 teeth, to 50-in. diameter, 15/32-in. or 1/16-in. kerf with 210 teeth as a maximum.

Takes Optimistic View

In the opinion of A. E. Adams, banker and industrial leader of Youngstown, Ohio, readjustment in the steel industry will neither be so prolonged nor so serious as in other commodity lines. Mr. Adams points out that iron and steel products are basic requirements of nearly every form of activity, that there is little accumulation of finished product and both the domestic and foreign deferred demand is heavy in addition to current requirements.

Strong financial position of the leading companies is another factor which will avert serious readjustment consequences, he believes. Most of the established producers, in their financial policies and programs, have made ample provision for contingencies toward which the industry seems to be drifting, and could weather a season of low prices and sporadic buying without serious financial embarrassment.

Gear Makers Discuss Business Situation

Progress Reports Made on Standardization and Addresses on This and Association Efforts and Manufacturing Overhead Rates

WHAT good may come from an association of manufacturers was proved again last week in in the fall meeting of the American Gear Manufacturers' Association. Naturally the present uncertain business situation came in for attention, largely of course in the informal gatherings and discussions between sessions, but the several years of close acquaintance and the laboring together to achieve standardization of manufacturing and commercial practices prepared the soil for plain talks on questions of business ethics. While possibly painting the immediate prospects for the industry in unduly drab colors, the sentiments expressed indicated a general conviction that undue pressure should not be put on customers but on the other hand no customers should be allowed to play fast and loose and take advantage of suppliers without reason. Clearly the representatives of the gear making institutions of the country feel they must do their share, as those identified with other industries should, to keep any business failure from shaking either the industries they serve or those on their own supply line.

Suspensions and cancellations have not stopped but they come from the automotive trade, and this means that some gear makers are hit harder than others, a few indeed having suffered no let up in demand. The fact remains that concentration on the business of the meeting was marked, that the lure of the wilds of the "Lake of the Sky," where the convention took place, was not sufficient to keep many after the last session. It is noteworthy that with urgent individual business problems developing daily, some sixty members were present, not to mention about 25 or 30 ladies.

The convention in the main was a clearing house for the progress reports of the association's various committees on standards. Definite recommendations for adoption are expected in a number of cases by the time of the annual meeting in the spring when such action may be taken. This meeting incidentally will be held in Cincinnati probably in March or April. Progress was reported particularly in what may be called design standards. The meeting was held at the Lake Mohonk Mountain House, Mohonk Lake, Ulster county, N. Y., with sessions on the afternoon of Oct. 27, all day Oct. 28 and the morning of Oct. 29. Besides the committee reports, addresses were made by Dr. P. G. Agnew, secretary American Engineering Standards Committee, on standardization from the point of view of his committee; by Calvin W. Rice, secretary American Society of Mechanical Engineers on standardization; by C. L. Collens, II, president Reliance Electrical Engineering Co., and past president of the Electric Club on "Industry Organization," and by Christopher Haigh, supervisor of costs, General Electric Co., on the "Machine Hour Rate Method of Distributing Expense."

Value of the Industry Organization

Mr. Collens in his address described the activities of the Electric Power Club. In the last two years it had been divided into sections, thus to relieve meetings of monotonous discussions engaged in by only a few. Meetings are now devoted to matters of broad interest. In the matter of standards, the proposal is to have these printed and distributed in advance of a meeting. He outlined the advantages of standardization in bringing about efficient quantity production, lifting a given manufacturing plant from the basis of a jobbing business, so common in Europe, with the result that there is a possibility of establishing lower prices and a stabilization of these prices.

The Electric Power Club has adopted a uniform cost accounting system. It has sent tariff experts to Europe and Japan to determine conditions affecting foreign made goods. It has done some work along the line of safety standardization and has plans for cooperation with foreign trade bureaus, with the Department of Foreign and Domestic Commerce, with the United States Chamber of Commerce and with Government representatives concerned with business. It is the medium through which foreign inquiries are distributed. It received commercial visitors from abroad.

The industry organization, he added, brings together groups having common interests. The United States Chamber of Commerce cannot fully do this, having bankers, farmers, commercial men, professional men and others among its members. A correlation of various industrial associations could express with authority the voice of industry in the United States, such as is exhibited in the case of the National Industrial Conference Board, and in a similar way by the League for Industrial Rights. In short, he emphasized that the industry association is an effective unit, and there are many great benefits, though somewhat intangible. Ten years ago he hardly knew men in the electric industry, while now he values even higher than some of his close personal friends his business acquaintances in the Electric Power Club.

A commercial advantage is that after a given job has been closed it is possible to get real facts concerning it instead of depending on the misinformation obtained in an indirect way through salesmen. Manufacturers were too prone in the past to accept the incorrect reports of sales representatives, and there is through the association acquaintance the possibility of developing a code of ethics. He mentioned in passing the practice of not taking an employee from an employer without first indicating to the employer the facts, with emphasis on having the decision based largely on the well-being of the employee, whose prospects may be better in the case of the one employer than with the other. Just as we have clean competition in sports, said he, there is no reason why we should not have similarly clean competition in business.

Spur Gear Standards

The report of the general standardization committee by B. F. Waterman, Brown & Sharpe Mfg. Co., Providence, R. I., reviewed briefly the work already done, covering in part the recommended practice adopted in the matter of composition gearing, gears for electric railroads and mines, and bevel gears in part.

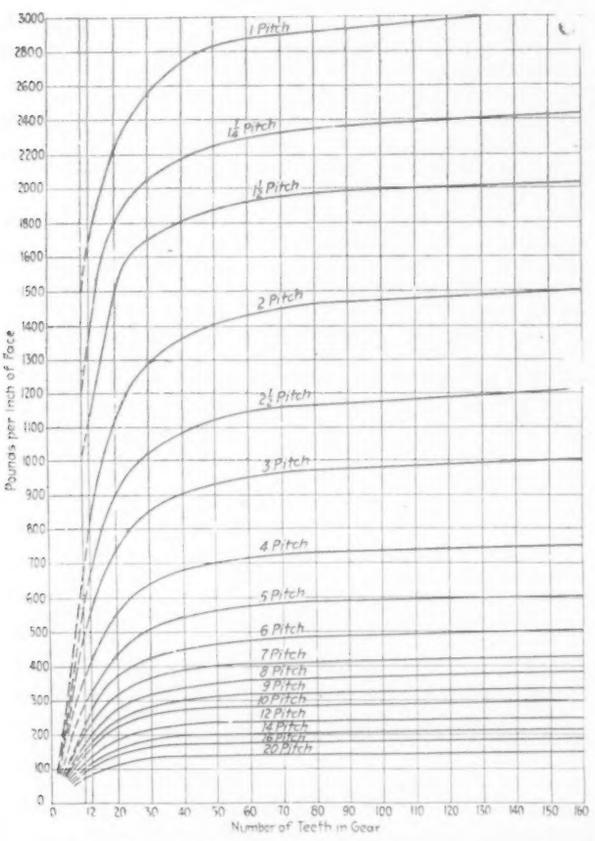
The report of the spur gear committee by F. E. Eberhardt, Newark Gear Cutting Machine Co., Newark, N. J., showed that there is far from a uniformity in practice in design or cutting, and that more definite progress is being made by the association in other items, leaving the simplest form of gear as the one likely to develop the greatest difficulties in arriving at an acceptable standard. In the matter of automobile spur gears the committee is to work with the Society of Automotive Engineers and the American Society of Mechanical Engineers. Much of the discussion revolved about the pressure angle and limiting the number of teeth for a given sized gear, thus to reduce the number of patterns now necessary to meet the requests of customers. J. B. Foote, Foote Brothers Gear & Machine Co., Chicago, expressed a preference for the 20 deg. pressure angle as satisfactory for both hardened and soft gears. Others expressed a belief that there should be a standardization of the curve of the tooth and a standard limit of thickness.

Other Gear Standards

A report on bevel and spiral gears was made for this committee by F. E. McMullen Gleason Works, Rochester, N. Y. It proved to be an extensive compila-

tion of tables, which was well received and is to be printed together with its drawings. The tooth clearance was put at 0.7 times the circular pitch, instead of 0.5 times the circular pitch. It was brought out that the Gleason Works had been using the factors for two years.

The sprocket committee, C. R. Weiss, Link-Belt Co., chairman, is co-operating with committees of the Society of Automotive Engineers and the American Society of Mechanical Engineers. The work is aiming at



developing an interchangeability of chains on sprockets and of component parts. The tooth form is in the last stage of design. New cutters are planned to provide for a pitch line clearance, in a reduction of the number of them necessary and for securing results which will allow for compensating for wear.

In the discussion of the report of the composition gearing committee, John Christensen, Cincinnati Gear Co., chairman, it was mentioned that the horsepower which may be transmitted by a rawhide gear is 80 per cent of that by an iron gear, but that real tests are needed. W. H. Diefendorf, Diefendorf Gear Corporation, Syracuse, N. Y., gave as a formula for the horsepower which may be transmitted by a rawhide gear as equal to the product of the circular pitch, the pitch diameter, the face of the tooth and the revolutions per minute divided by 850. A load of 150 lb. per inch of surface for 1 in. circular pitch was put as the safe figure, that if the pressure is increased to, say, 250 lb., the rawhide is compressed sufficiently to distort the contour of the tooth and bring about a temperature which is calculated to crystallize the material, with resultant trouble.

Reports were also made on gears and pinions for electric railroads and mines by W. H. Phillips, R. D. Nuttall Co., Pittsburgh, chairman; on keyways by H. J. Eberhardt, Newark Gear Cutting Machine Co., chairman; on herringbone gears by A. F. Cooke, Fawcus Machine Co., Pittsburgh, chairman, and by the committee on hardening and heat treating, which has recommended that it hereafter be called the metallurgical committee. The discussion on the herringbone gears indicated prevailing sentiment against the staggered tooth arrangement as likely to give thrusts intermittently in opposite directions, and it was also emphasized that the standardization should not necessarily be for high-speed gears.

In discussing the report of the committee on worms, gears and spirals, J. C. O'Brien, Pittsburgh Gear & Machine Co., Pittsburgh, chairman, Mr. Foote contributed the accompanying chart of the power which may be transmitted by various gears. Mr. O'Brien emphasized that what is wanted is a standard series of worms, then ascertaining the horsepower which may be transmitted.

The report of the inspection committee, E. J. Frost,

STRENGTH OF GEARS

The accompanying chart, based upon the Lewis formula, and prepared by the Foote Brothers Gear & Machine Co., Chicago, gives the safe working load in pounds per inch of face on teeth of cast iron gears whose peripheral speed at pitch line is zero ft. per min.

Tensile strength of cast iron taken as 8000 lb. per sq. in. For steel gears not hardened, multiply values by 2½; if hardened, multiply values by 4.

At zero velocity the Lewis formula becomes 8000 x outline factor Y x face ÷ diametrical pitch.

The values taken from the chart are to be multiplied by a strength factor whose value is dependent upon the pitch line velocity in feet per minute.

The pitch line velocity, denoted as V, is found by multiplying the pitch diameter in inches by the r.p.m. and the product multiplied by 0.262.

Table of Strength Factors

V	Factor	V	Factor
50	0.928	600	0.500
100	0.857	900	0.400
200	0.750	1200	0.333
300	0.666	1800	0.250
450	0.571	2400	0.200

Formula to convert the number of pounds pressure into horsepower: Hp. = V x lb. pressure ÷ 33000.

EXAMPLE: Find the horse-power a 20-tooth 2½-pitch 4-in. face hardened steel gear will safely transmit at 600 r.p.m.

From chart, lb. press. = 900 the face (4 in.) × 900 = 3600. 3600 × hardened gear factor (4) = 14400 lb.

From formula, V = 8 × 600 × 0.262 = 1257 ft. per min.

Strength factor for V = 1200 is 0.333. 0.333 × 14400 lb. = 4800 lb. safe load.

Hp. = 1200 × 4800 ÷ 33000 = 174.5.

Frost Gear & Forge Co., Jackson, Mich., chairman, is in part as follows:

Inspection Standardization

Since the Detroit meeting more consideration has been given to standardization of hole gaging than to other phases of our work, although at this time we are making other recommendations. Because of objection on the part of some of the association members at the annual meeting to making the "will go" end of the plug gage undersize and the probability of meeting considerable objection on the part of our customers, we decided to make the following recommendations:

That cylindrical holes up to 3 in. in diameter be inspected with "will and will not go" plug gages, the "will go" end to be the same as the smaller limit and the "will not go" end the larger limit given on the customer's drawing.

That for holes between 3 and 12 in. in diameter, bar gages be used, in which there are two bars at right angles to each other, held together by a handle pressed into a hole in the middle of each bar; one bar being the "will go" and the other the "will not go"; the nature of the piece being inspected, principally the length through the bore, determining the length of the connecting handle and whether the bars shall be close together or at opposite ends.

That holes larger than 12 in. should be measured with measuring rods or inside micrometers set to vernier calipers or verified by a measuring machine.

Tolerance for wear to be allowed before discarding gages is given in the table:

Tolerances for Wear in Gages for Cylindrical Holes

Size of Hole, in.	Class 1, in.	Class 2, in.	Class 3, in.
0 to ½	.00007	.00010	.00015
½ to 1	.00010	.00015	.00020
1 to 2	.00015	.00020	.00030
2 to 3	.00020	.00025	.00040
3 to 4	.00030	.00035	.00055
4 to 5	.00040	.00050	.00070
5 to 6	.00055	.00065	.00090
6 to 8	.00070	.00085	.00115
8 to 10	.00090	.00105	.00145
10 to 12	.00110	.00130	.00180

For holes larger than 12 in. use 2, 3½ and 5 ten-thousandths per each additional inch of bore diameter, respectively, for the three classes of work.

Tapered Holes

Should be inspected with tapered plug gages and the quality of fit determined by painting the gage with red lead or prussian blue and a full bearing should be shown. Proper depth of reaming or grinding should be indicated by a stepped shoulder, located at either end of the plug, as the case may require, the height of the step and relationship to the taper agreeing with limits given on customer,s drawing.

Keyways

(In both straight and tapered holes and for both single and multiple keys.)

Should be inspected for width of keyway by using "will and will not go" bar gages, gaging the width only.

For alignment and depth, a plug gage should be used, where body diameter is the small limit of the hole and having a key long enough to reach the entire length of the keyway, the width and height of the key gage agreeing with the customer's small limit.

If the maximum depth is important, a similar gage should be used as a "will not go," having a key height equal to the maximum shown on the customer's drawing.

Association Machine to Test Involute Curves

The report covered also Woodruff keys, test stands, splined shafts, etc. As to thread gages, the report recommended the use of plug or ring gages made by a reputable concern and in case of dispute to have a check by the Bureau of Standards. "Will and will not go" gages, it is added, should be used for accurate work. It was also recommended that the association have designed and built an instrument for determining the accuracy of involute curves in cutters or work, and that it be installed in the Bureau of Standards at Washington. All disputes over accuracy of micrometers, gages, etc., the report continues, may at the request of buyer or seller be referred to the Bureau of Standards, whose report shall be accepted as final and the expense of such testing borne by the owner of the instruments tested, unless otherwise agreed upon. In making comparisons of dimensions, the same temperatures should be used as are maintained by the Bureau of Standards.

Backlash was defined as the distance between teeth when inspected on a proper test stand, preferably when using a proved master gear, the center distance to be standard unless specified otherwise. A satisfactory way of checking the amount would be by the use of standard feelers.

Uniform Cost Accounting

J. H. Dunn, R. D. Nuttall Co., made a report for the committee on uniform cost accounting. One cost clerk, he felt, should suffice for a plant of 75 to 100 workmen, so that five would suffice for a plant of 500 employees. A plant doing strictly jobbing work might have to increase the clerical force somewhat. A plant of 50 to 60 employees would find it possible to have one person take care of the cost accounting and also the payroll and time keeping. The point was made that over a period of many years one does not find the large and sudden changes in prices which have characterized industry the last few years. In reporting, finally, the committee is likely to consider separately problems of the shop of 50 employees up to that of 2000.

The question arose as to the percentage of the total business which should properly be spent on advertising. It was the contention that it is not practical to lay down a definite percentage and that it is not, at any rate, a matter of accounting, but one of commercial policy. In the matter of advertising a new line the expenditures might well be considered as making it desirable to open a commercial development account. In this a record could be kept of the various units, largely so that later a return could be made to the company. Under the subject of advertising is included catalog work, convention expenses and the like.

W. H. Lyman, Warner Gear Co., Muncie, Ind., brought out how cost accounting will uncover the expenses of idle essential machines, and accordingly the repairs to such essential machines in his plant are given priority. A. A. Alles, Jr., Fawcus Machine Co., and secretary-treasurer of the Industrial Cost Association, Peoples Bank Building, Pittsburgh, pointed out how the wrong angle is taken in considering the cost of keeping costs. Instead, cost keeping should be thought of from the point that it gives an analysis of one's business.

A discussion of the report of the commercial standardization committee brought out that quite a number are using the proposal form as a contract form. Where some buyers had attempted to secure a 2 per cent reduction for prompt payment, the 1 per cent discount provided for by the association form was adhered to when the matter was once brought to the attention of the buyer. The remainder of the meeting was taken up with a discussion of the special conditions confronting the industry, and in particular with a tendency here and there to regard contracts as mere scraps of paper.

The Diamond Chain & Mfg. Co., Indianapolis, and the Diamond State Fiber Co., Bridgeport, Pa., were elected to membership.

Machine Rate Hour in Distributing Expense*

General Advantages Recounted to Prove It the Only Safe and Scientific Method

IN the machine hour rate method, the overhead charge is not an average charge for the whole plant or department, but is, as nearly as possible, the actual overhead cost of maintaining and operating each of the machines, group of machines, benches, etc., which are found in the plant. By the proper use of this method it is possible to show the difference between the expense cost of a boring mill and a lathe, a gear cutter and a splining machine, etc. The advantages of this system are well covered in several books written by A. Hamilton Church.

Rental Charges of Production Centers

To install a machine rate method, we would first find the number of square feet of productive floor space available for manufacture, eliminating the space used for foremen's offices, stairways, washrooms, stockrooms, etc. We would use the number of square feet so obtained as a divisor for determining the cost per square foot per year for maintenance, depreciation, taxes, insurance and other kindred charges applying against the land and building. We would not include any expenses in this group which were incident to the actual operation of the machines, but only those charges which applied against the empty building ready for manufacture. We would include, however, the expense of lighting and heating the building and charges of a similar character. In this way we would get a charge per square foot which is practically the same charge which the owner of a building would make if he rented it to us and furnished the light, heat and water used in the building, except that he would require a profit on his investment which we would forego in the expectation of making this profit on the gears which we manufactured.

We would next divide the factory into production centers, including in each center machines of a similar character located together, or individual machines where there were no convenient groups. We would never include different kinds of machines in one production center, as this would defeat the object of this system. After the division into production centers had been made, we would determine the number of square feet occupied by each center, including in this area the space required for the material waiting to go on the machines, the space required for the workmen, etc.,

*From a paper by Christopher Haigh, supervisor of costs, General Electric Co., read before the American Gear Manufacturers Association, Lake Mohonk, N. Y., Oct. 29.

and would charge each center with a part of the rental of the whole building, based upon the area occupied. This division would give us the rent per year for each production center, and in this way we would allocate the total charges of the building, which we have called rental charges, to various production centers. We now have one part of our expenses divided in such a way that we can include them as one factor in the machine hour rate.

Expense Items for Operating and Maintenance

We would next determine the actual cost of the expense items incident to the operation and maintenance of each of the production centers. These expenses consist of depreciation of the machinery and equipment, taxes, repairs, small tools, cutting oils and other charges which can be definitely allocated to the one or more machines which have been included in one production center. If a small group of machines, all included in one center, require the entire time of one foreman, the wages paid this foreman would be included with the other expenses in arriving at the total cost of operating the centers.

The distribution of the power charge can best be made on the basis of the horsepower required by each production center. In this power charge we would include the expense of running the power plant as well as the shafting, belting, etc.

The expenses which we are dividing should cover a period long enough to insure correct results, and should cover a period of normal operations so that our results will represent the hourly cost of operating our production centers in normal times and under normal conditions. The best results are obtained if the expenses for a whole year are used as a basis for the machine hour rate, and if these expenses are carefully analyzed and allocated to the various production centers, the hourly rates first determined will not require much adjustment. In fact, the success or failure of the system depends on the amount of attention given to the division of the expenses at the start, as, unless the first rates are approximately correct, the first results obtained from the system will be so disappointing and misleading as to cause a manufacturer to condemn it and to insist for all time that the plan is no good.

By adding the rental charges and the charges for operating and maintaining the machines, we have the basis for determining the hourly cost of expense applicable to work on the machine hour basis. To determine the hourly charge, we must estimate the total normal hours which each production center will work per year.

Supplementary Charge for Administration, Etc.

There still remain a few items of expense which have not been distributed, such as supervision, clerical and general administrative expenses. These expenses should be totaled, and this total divided by the sum of the normal hours of all the production centers. The result of this is another hourly expense cost which is to be added to each machine rate as a supplementary charge.

It is obvious that no man can predetermine accurately the number of hours any machine in his plant will be occupied, and many people reject the idea of installing this system for that reason alone. I think you will agree, however, that either by keeping records or examining records already available, a close approximation of the normal working time of any machine can be found, and if the expenses of operating the machine are based on an approximately correct operating time, we have, by the machine hour rate method, a means of showing immediately the financial effect of any variation of the operating time of the machines from the predetermined normal or standard operating time.

In making up the hourly rates we assumed that we had a certain amount of expense, say, $1,200, to absorb in a certain period, say one year, over one production center. Let us say that we estimated that the normal hours that this center would be used in the year were 2400, or 200 per month. On this basis the hourly expense cost of operating this production center is 50 cents. By adding 50 cents for each hour that a job required the facilities of this production center we would expect to absorb all the expenses connected with it. Now if the jobs passing through this center in a month required the use of the facilities for only 180 hr. we would see at the end of the month that on this particular center we had failed to absorb $10 of our expenses. We would have the same information for all other centers, and, therefore, for the whole shop, and would know at the end of the month how much of the manufacturing facilities had not been used or had been used more than we expected, this information being available both in terms of hours and money.

It is not, of course, expected that any manufacturer would absorb all of the difference between the amount of expense actually absorbed and the amount which he expected to absorb, and to insure that all expenses are included in cost a supplementary charge is made to each job to liquidate the amount of expense which has not actually been absorbed through the machine rates in use.

Indicating the Use of Plant Facilities

This supplementary rate is a part of this system of expense distribution and is, in fact, a valuable factor because we know from the amount which we add to cost to absorb these supplemental charges how far from normal the plant is running. In fact, one of the great benefits of this system is that the supplementary rate soon shows if machines are idle because the expenses which would be absorbed by machines which had work to do become, when these machines are not in use, a part of the supplementary charges, and the fluctuations in the monthly amounts liquidated by means of this charge show to a great extent the efficiency with which the facilities of the plant are being used.

If you were given the opportunity to bid on an inquiry for gears which would require your biggest machines you would certainly make your price such that your expected profit would actually be profit on that particular job, and would include in the cost on which this profit was based the actual overhead expense of the mechanical equipment to be used. If your price, assuming that your profit was reasonable, was such that you lost the order to some one who was quoting a price based on an average overhead, you would feel perfectly sure that this other concern was taking business at a loss and would be willing to let them have the order. Conversely, there are many jobs which require less machinery and cheaper equipment, and your method of arriving at costs would allow you to take this kind of business at a price lower than the concern whose costs were not accurately determined.

I believe that the reason this machine rate method is not in more general use is because of the amount of work which is required in getting the system working and the extra bookkeeping involved in keeping the records, which must be available if this plan is followed. Most manufacturers have an objection to increasing the administrative expense of their business and would rather spend money for new machinery than for a system of records. This attitude is certainly correct if there is no doubt that the business as run without these records brings in satisfactory profits and will continue to do so and if the new machinery earns its keep, but in any business which is to any large extent competitive the need for accurate records will sooner or later be felt, and I am firmly convinced that those concerns which have the best system of cost records will be in existence long after the manufacturer who figures his cost on the hit or miss method has gone out of business.

Discussion

In the discussion C. B. Hamilton, Jr., Hamilton Gear & Machine Co., Toronto, told of his using the machine hour rate. The total capitalization value of the machinery as carried on the books was reapportioned in terms of what he called the working value of the machines. Thus while certain machines were bought for specific war purposes or were well worn in the production of munitions, they are now utilized in the peace time production, but given arbitrary values that have a relation to the character of work done and are such that the total amount for all machines is the amount carried on the books.

More Cars Available for Hauling Steel

Open Top Order Now Only One Remaining of Series Issued to Expedite Coal Movement—Production Increases

WASHINGTON, Nov. 1.—Suspension of the order confining the use of open top cars with sides 38 in. in height and over to coal is expected within the next 10 days or two weeks. The open top car order is now the only one of the series issued by the Interstate Commerce Commission to expedite coal movement remaining in effect. The commission during the past week suspended the order providing for the movement of coal to Lake Erie ports for transshipment by water to the Northwest. Coal had accumulated in such quantities at the Lake Erie ports as to make the continuation of the priority order no longer necessary.

With the lifting of the open top car restriction, many cars would be released for the use of the steel industry which are now devoted to the transportation of coal. With the gradual improvement in the coal situation, many of the coal cars already have been diverted under special permits granted by the commission. The total of cars thus diverted is more than 170,000. Most of them have been released for the movement of building and road materials and certain perishables such as sugar beets.

Shortage for Domestic Use

There still remains a shortage of coal for domestic use in the central territory. Until this shortage is met, which it is expected will be before Dec. 1, it probably will be considered advisable to keep the open top car order in effect. With the suspension of Service Order No. 10 applying to movement of coal to Lake Erie ports, it is believed that the mines and railroads will be able to take care of the domestic coal shortage in a brief time.

The commission in announcing the suspension of the Northwest coal priority order stated that the demand for coal at the Lake Erie ports for transshipment to the head of the lakes is now less than at any time since the order was promulgated. Up to Oct. 26 it was stated there had been actually dumped into vessels at the lower lake ports 18,572,518 tons, with 580,000 tons in the cars at ports awaiting dumping and approximately the same amount en route. The commission has received assurance that the customary lake suppliers will continue to ship their commitments to the lower lake ports without any preference order.

The commission states that an unusually large amount of coal had been moved to the Northwest by all-rail lines this year. Although the tonnage shipped by lake has fallen below figures of previous years, it is the belief of members of the commission that the Northwest needs will be taken care of.

Since Oct. 15 it has not been found necessary by the commission to issue a priority order for any public utility or Governmental agency.

Production Is Heavy

For the third week in succession, production of bituminous coal during the week ended Oct. 23 was above the 12,000,000 ton mark. The output during the week, according to the report of the Geological Survey, was estimated at 12,146,000 net tons, an increase of 45,000 tons over the revised figure of the preceding week. The total output for the month probably will be the largest attained in any October on record except in October of the war year 1918, and in the month of October, 1919, just before the great coal strike.

Production of anthracite continued to increase during the week, the total output being estimated at 1,915,000 tons. This figure is less than the corresponding week of 1919 when 1,992,000 tons were produced.

Production of beehive coke declined slightly during the week because of slackening demands. The total output was estimated at 389,000 tons, a decrease when compared with the preceding week of 14,000 tons, or 3.6 per cent. In spite of the decrease, current production is greater than that of the corresponding period of a year ago when demand for coke was curtailed by the steel strike. Cumulative production of coke since Jan. 1 now stands at 17,264,000 as against 15,852,000 tons last year, an increase of nine per cent.

There was another increase in the dumping of bituminous coal at Lake Erie ports during the week, the total being 1,138,217 tons, which was the best performance of the year excepting in the last week of August.

Dumpings at tidewater of bituminous coal reached the high figure of 1,375,000 tons during the week ended Oct. 24. New England shipments declined somewhat, and exports also decreased slightly, but there was a notable increase in the tonnage supplied as bunker coal, a change in part attributable to an increase in demand which seems to have accompanied the British coal strike.

Supplies of Ferrovanadium

The following communication to the London *Ironmonger* is of interest as coming from an American producer of ferrovanadium and as bearing on the lack of supplies in Great Britain:

Sir:—Referring to your article on the vanadium market in *The Ironmonger* of Aug. 14, p. 95, you may like to know that next to the Vanadium Corporation of America we are the largest producers of ferrovanadium. We believe our supply of ores is much greater than that of the Vanadium Corporation, although we are only just now getting our output up to the point where we can become a factor in the vanadium trade; and while our ore is somewhat lower in vanadium content than the Peruvian ore mined by Vanadium Corporation of America, we do not have nickel, sulphur, and other impurities to contend with, and within a short while our capacity will be very materially increased. We now have a mill of 60 tons daily capacity in operation, and have plans well under way for a new mill of 300 tons daily capacity which we hope to have in operation within a year. Our ore supplies are unlimited, and our product is of the highest quality. The domestic demands for our product since our mill started (February, 1920) have been so great that we have been unable to fill them yet. Notwithstanding this we have already made several shipments to England of two, three and five ton lots, principally to John Nicholson & Sons, Sheffield, and Sir W. G. Armstrong, Whitworth & Co., Manchester. We hope through our allotments to England during the next few months to disprove any idea of discrimination which may be in the minds of our English friends.

Yours very truly,
THE COLORADO VANADIUM CORPORATION.
26 Beaver Street, New York, Aug. 27.

Detroit Awards Protested

DETROIT, Nov. 1.—The following contracts were last week awarded by the Detroit city council for supplying equipment for use in constructing the municipal street railway lines: Six steam shovels, at $8,915.50 to the Ball Engine Co., Erie, Pa.; 90 bucket cars at $265 each, Lakewood Engineering Co., Cleveland. A number of other bidders protested the awards on the ground that they were not made in accordance with specifications, that the highest bidders in some cases received the award, and that those able to make quickest deliveries were not considered.

Downward Trend in Iron and Steel Exports

Movement to Foreign Countries Declines Slightly in September, but Pig Iron and Structural Shapes are Exceptions to Rule—Value of Imports Increases

WASHINGTON, Nov. 1.—September, 1920, exports of iron and steel again remained above the 400,000 ton mark, thereby exceeding the September, 1919, figures by a liberal margin, but dropping below the August, 1920, total. The preliminary figures compiled by the Bureau of Foreign and Domestic Commerce also show an increase in the valuation of iron and steel exports for September, 1920, as compared with September, 1919, and a slight decrease from the August, 1920, figures.

The total manufactures of iron and steel exported in September, 1920, according to these figures, aggregate $87,556,292, against $73,376,508 in September, 1919, and $89,065,343 in August, 1920. For the nine months' period ending with September, 1920, this makes a total of $781,361,542, against $758,039,712 in the same period of last year. In September, 1920, the exports of iron and steel aggregate 409,200 gross tons, against 364,504 tons in September, 1919, and 431,484 tons in August, 1920. For the first nine months of the current year these exports aggregate 3,544,489 tons, against 3,505,387 tons in the same period of last year. Pig iron exports aggregate 22,724 tons in September, 1920, against 18,991 tons in September, 1919, and 22,645 tons in August, 1920. For the nine months' period, however, the pig iron figures show a reduction, aggregating 175,604 tons for the first nine months of 1920, against 271,112 tons in the first nine months of last year. The exportation of steel plates in 1920 totaled 75,612 tons, against 52,855 tons in September, 1919, and 65,769 tons in August, 1920. This brings the nine months' figures to 635,886 tons for the current year, against 557,909 tons for the first nine months of 1919.

Exports of Iron and Steel

	Gross Tons			
	September		Nine Months	
	1919	1920	1919	1920
Ferromanganese	3	297	1,983	1,483
Ferrosilicon	12	64	1,391	401
All other pig iron	18,976	22,363	267,738	173,720
Scrap	3,775	44,660	14,679	166,585
Bar Iron	3,773	4,846	53,096	30,801
Wire rods	6,513	6,837	93,823	97,409
Steel bars	50,684	41,542	432,088	459,180
Billets, ingots and blooms, n.e.s	37,513	18,113	202,962	194,563
Bolts and nuts	2,788	2,844	32,652	27,900
Hoops and bands	2,409	3,920	40,432	38,440
Horseshoes	108	290	2,901	1,413
Cut nails	220	361	2,552	2,125
Wire nails	7,545	7,826	76,450	61,974
All other nails, including tacks	898	750	13,866	7,901
Cast-iron pipes and fittings	2,630	5,104	28,580	41,699
Wrought-iron pipes and fittings	17,160	19,667	191,835	195,267
Radiators and cast-iron house-heating boilers	1,086	364	3,494	5,324
Railroad spikes	1,919	836	21,510	11,836
Steel rails	58,424	31,170	520,228	421,133
Galvanized sheets and plates	9,196	6,213	80,537	80,342
All other sheets and plates	6,332	1,921	33,515	21,364
Steel plates	52,855	75,612	557,909	635,886
Steel sheets	13,380	13,342	142,310	118,767
Ship plates, punched and shaped	998	3,459	10,079	32,145
Structural iron and steel	21,933	60,315	295,597	333,433
Tin and terne plates	16,838	13,234	158,274	169,700
Barb wire	9,514	6,420	70,917	87,062
All other wire	17,022	16,830	153,989	126,636
Total	364,504	409,200	3,505,387	3,544,489

Another important increase is itemized in structural iron and steel, with a September, 1920, export of 60,315 tons, against 21,933 tons in September, 1919, and 36,603 tons in August, 1920. For the first nine months of 1920 this makes up an aggregate of 333,433 tons, against 295,597 tons in the first nine months of 1919. It is interesting to note that much of the September, 1920, increase in this commodity is due to the shipment of 25,830 tons of structural iron and steel to British India.

The most striking slump is that of steel rails, of which the September, 1920, exports aggregate 31,170 tons, against 58,424 tons in September, 1919, and 56,160 in August, 1920. This drop brings the nine months' total almost 100,000 tons below the same figures for last year. In the first nine months of the current year the steel rail exports totaled 421,133 and in the same period of last year they aggregated 520,228 tons.

Steel bars also show a decrease with the September, 1920, exports of 41,542 tons, against 50,684 tons in September, 1919, and 54,344 tons in August, 1920.

Imports of Iron and Steel

	Gross Tons			
	September		Nine Months	
	1919	1920	1919	1920
Ferromanganese	1,655	6,524	18,649	40,039
Ferrosilicon	1,015	1,159	5,634	11,543
All other pig iron	8,845	6,081	23,341	102,130
Scrap, including tin	25,030	9,486	126,360	119,872
Bar iron	205	382	1,248	4,048
Structural iron and steel	34	89	743	1,114
Steel billets without alloys	289	301	4,398	18,032
All other steel billets	320	249	1,884	3,539
Steel rails	27	6,563	14,666	42,064
Sheets and plates	22	144	716	1,321
Tin and terne plates	18	9	149	279
Wire rods	31	712	149	3,334
Total	37,491	31,699	197,937	347,415
Manganese ore and oxide	19,601	88,422	269,411	423,012

Scrap exports continue strikingly heavy. The September, 1920, outgo was 44,660 tons, against 3775 tons in September, 1919, and 37,573 tons in August, 1920. For the first nine months of the current year these exports of scrap totaled 166,585 tons, against 14,679 tons in the first nine months of last year.

In checking up the valuations of the exports it is interesting to note that the pig iron outgo for September, 1920, exceeded that of September, 1919, by $400,000; that of scrap increased $1,400,000; that of hoops and bands, $240,000; nails, $200,000; pipes and fittings, $1,100,000; tools, $350,000; wire and manufactures of wire, $650,000; sheets and plates, $2,000,000; structural iron and steel, $2,300,000; and machinery, approximately, $6,500,000. Pig iron dropped $200,000; billets, ingots and blooms, $1,200,000; tin plate, $300,000, and rails, $1,400,000.

Exports, January, 1919, to September, 1920

	Gross Tons		
	All Iron and Steel	Pig Iron	Semi-finished Material
January, 1919	360,456	35,793	11,594
February	234,793	20,178	10,407
March	344,506	22,054	8,176
April	408,204	16,300	11,488
May	447,050	32,233	20,771
June	544,580	39,540	46,016
July	287,823	38,373	21,318
August	396,743	36,071	36,162
September	363,505	18,991	37,513
October	302,456	14,108	20,713
November	295,045	21,429	13,211
December	254,676	14,612	21,538
Total	4,239,837	309,682	258,907
January, 1920	333,601	18,468	19,937
February	308,185	15,739	22,693
March	417,216	22,740	30,444
April	395,120	14,608	19,032
May	420,359	13,032	16,370
June	402,707	17,075	29,811
July	458,866	29,647	17,243
August	431,484	22,645	20,920
September	409,200	22,724	18,113

Exports of Machinery

	September		Nine Months	
	1919	1920	1919	1920
Adding machines	$314,726	$437,847	$3,137,169	$4,013,868
Air-compressing machinery	212,709	254,111	2,827,216	3,783,986
Brewers' machinery	1,155	81,915	147,886	399,146
Cash registers	229,866	276,840	2,538,270	4,400,286
Parts of	26,860	54,224	200,887	365,450
Concrete mixers	16,243	79,185	144,442	562,179
Cotton gins	16,541	17,948	288,361	361,980
Cream separators	106,867	41,928	906,368	852,436
Elevators and elevator machinery	51,810	73,939	2,275,482	1,025,961
Electric locomotives	502,200	.....	739,658	844,130
Gas engines, stationary	30,771	91,243	455,020	583,892
Gasoline engines	2,761,776	3,163,593	26,366,637	28,013,520
Kerosene engines	723,233	977,143	6,419,150	7,897,572
Steam engines	2,674,662	4,444,264	21,884,727	44,910,738
All other engines	274,689	310,812	2,876,477	3,387,216
Boilers	548,856	847,447	4,482,712	5,248,917
Boiler tubes	564,994	455,654	7,102,396	3,674,298
All other parts of engines	1,596,156	1,525,348	19,790,455	15,247,175
Excavating machinery	93,346	240,407	725,056	1,491,917
Milling machinery, flour, grist	201,109	262,835	1,939,304	1,339,876
Laundry machinery, power	79,621	78,698	537,006	860,121
All other	22,274	65,836	396,346	546,971
Lawn mowers	70,774	18,171	413,983	269,581
Lathes	724,960	506,781	8,096,380	5,997,997
Other machine tools	841,956	1,176,175	9,718,958	10,394,768
Sharpening and grinding machines	313,581	333,844	4,341,255	3,146,014
All other metal working machinery	1,991,005	1,190,343	23,320,038	14,342,265
Meters, gas and water	69,771	36,633	583,171	508,066
Mining machinery, oil well	151,300	531,238	2,663,394	3,835,856
All other	723,606	543,624	7,740,514	6,425,214
Paper-mill machinery	357,254	242,682	3,242,315	1,715,509
Printing presses	275,820	820,050	2,596,942	6,459,767
Pumps and pumping machinery	817,348	827,198	6,651,992	8,803,219
Refrigerating and ice-making machinery	89,432	314,030	1,664,604	2,702,779
Road-making machinery	115,829	67,169	701,987	930,559
Sewing machines	1,008,035	752,864	9,528,546	11,625,776
Shoe machinery	289,332	224,644	2,055,954	1,673,306
Sugar-mill machinery	1,227,768	2,705,310	8,279,553	11,532,511
Textile machinery	1,371,923	2,011,879	11,441,998	14,850,268
Typesetting machines	248,195	394,838	3,190,211	3,646,526
Typewriting machines	1,558,668	1,443,474	13,010,167	19,000,347
Windmills	83,290	171,334	814,320	1,408,899
Wood-working machinery, saw mill	58,739	83,175	987,933	811,665
All other	226,662	228,423	1,882,307	2,623,086
All other machinery and parts of	5,987,667	7,606,439	55,266,256	67,852,208
Total	$29,653,379	$36,008,016	$284,273,803	$330,364,301

The exports of machinery in September, 1920, total $36,008,016, as against $29,653,379 in September, 1919, and $35,542,796 in August, 1920. For the first nine months of the current year this makes a total of $330,364,301, against a total of $284,273,803 in the same period of 1919.

The exports of engines and engine parts in September, 1920, totaled $11,811,985, against $9,677,337 in September, 1919, and $12,437,703 in August, 1920. For the first nine months of 1920 this makes a total of $109,803,938, against $90,117,232 in the first nine months of 1919.

Metal working machinery exports aggregated $3,207,143 in September, 1920, against $3,871,502 in September, 1919, and $2,908,493 in August, 1920. For the first nine months of 1920 these exports totaled $33,881,044, against $45,476,631 a year ago.

The imports of iron and steel in September, 1920, show a heavy increase in values, although there is an interesting slump in tonnage due to the decline in the importation of scrap. In September, 1920, these imports totaled $4,771,484, against $2,339,135 in September, 1919, and $6,544,925 in August, 1920. For the first nine months of the present year they totaled $38,641,847 against $17,372,769 in the first nine months of 1919. The imports of machinery were $794,613 in September, 1920, against $388,308 in September, 1919, and $1,041,707 in August, 1920. For the first nine months of the current year these imports total $6,154,129, against $2,885,836 in the same period a year ago.

Imports of manganese ore and oxide of manganese totaled 88,422 tons, worth $1,499,206, in September, 1920, against 19,601 tons, worth $591,092 in September, 1919, and 99,601 tons, worth $2,265,943, in August, 1920. For the nine months ending with September, 1920, these imports aggregated 423,012 tons, with a valuation of $9,042,630, against 269,411 tons valued at $9,351,017 in the same period of last year. O. F. S.

Metal Shipments Through Panama Canal

SEATTLE, WASH., Oct. 27.—The saving in freight rates over all-rail hauls by the use of the boats of the intercoastal lines, whose service was recently established between Seattle and Eastern ports, is strikingly illustrated by a recent shipment. The Anaconda Copper Co. received an order for 1000 tons of copper and one for 1000 tons of zinc, both to be shipped from its smelters at Great Falls, Mont. Instead of making an all-rail shipment from Great Falls to New York, which was the destination, the Anaconda company shipped all the zinc and copper to Seattle, and from this city it is being sent to New York via two of the intercoastal lines through the Panama Canal. The Isthmian Steamship Lines, owned by the United States Steel Products Co., will carry the 1000 tons of zinc in one of its boats known as the Steel Maker, while the copper will be carried by another intercoastal line. The freight rate on the zinc and copper from Great Falls to Seattle is $7.80 per ton, and from Seattle to New York, via the Panama Canal route, it is $8 per ton, or a total of $15.80. The all-rail rate from Great Falls to New York by the Great Northern Railroad or the Chicago, Milwaukee & St. Paul is $22 per ton. Thus the saving was $6.20 per ton, making a total of $12,400 on the two shipments. The time made is as good as by shipping all-rail from Great Falls to New York, probably shorter.

The importance and advantage of these new intercoastal lines is steadily becoming more evident. Last spring not a single fleet was in operation in the intercoastal service from Seattle via the Panama Canal, while now Eastern and Western shippers have the services of the fleets of the Isthmian Steamship Lines, the American-Hawaiian Line, the North Atlantic & Western Steamship Co., the Luckenbach Steamship Co. and the Atlantic, Gulf & Pacific Steamship Co. The Submarine Boat Corporation will start next month to place 32 steamships in this service.

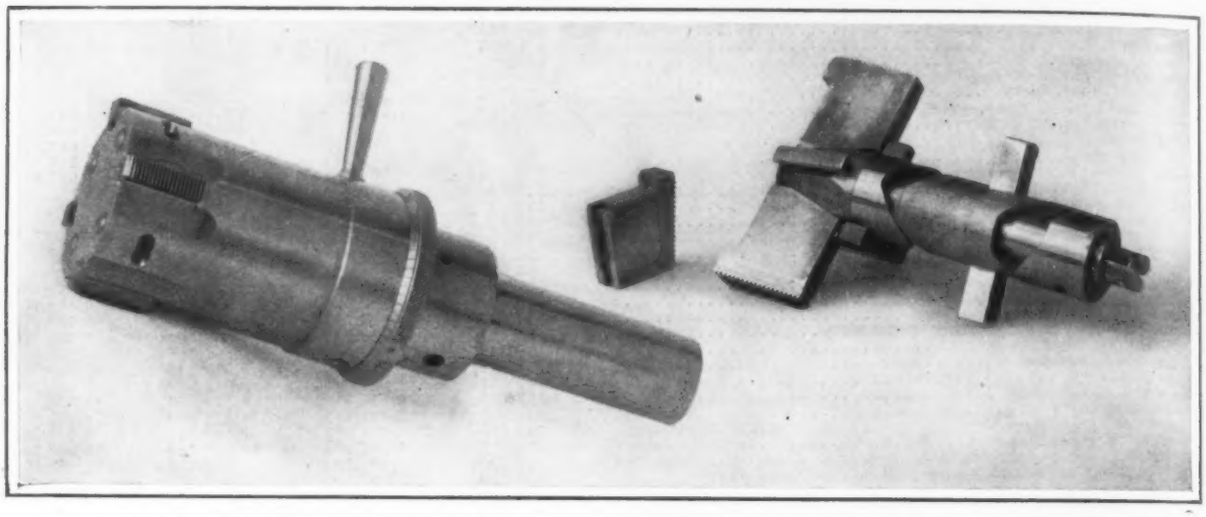
As a result of the starting of these intercoastal lines, the domestic commerce of Seattle showed a gain in the four months ended Sept. 30 of 183,167 tons. In the four months ended Sept. 30 the domestic commerce at Seattle amounted to 1,497,154 tons, as compared with 1,313,987 tons in the same period last year.

Collapsible Taps from 1 In. to 10 In.

A new collapsible tap is announced by the Rickert-Shafer Co., Erie, Pa. The outstanding feature is the method of withdrawing the chasers when the work is tapped to the required depth; the manufacturer explains that it is positive acting in that it will not stick. This is of particular advantage where work has to be tapped close to the bottom of the hole, in which case, it is explained, the operator can rely upon the tool as the chasers will be released at exactly the right point.

The accompanying illustration shows the details of construction. At the point of release the force of the cut pulls the head from the locking pins aand revolves it. This action causes the cams on the core to act and pull the core back, drawing the chasers in the head and clearing them from the work. Special attention is directed to the fact that no springs are used for the purpose of collapsing, also to the method of making adjustments which allow these to be made to the fractional thousandths.

The manufacturer states that the taps will hold to size within exacting limits thus to make the use of sizing hand taps unnecessary. Taps are made in sizes from 1 to 10 in. or larger and can be specially combined with boring, reaming or chamfering tools thus to increase production by eliminating additional operations and set-ups.



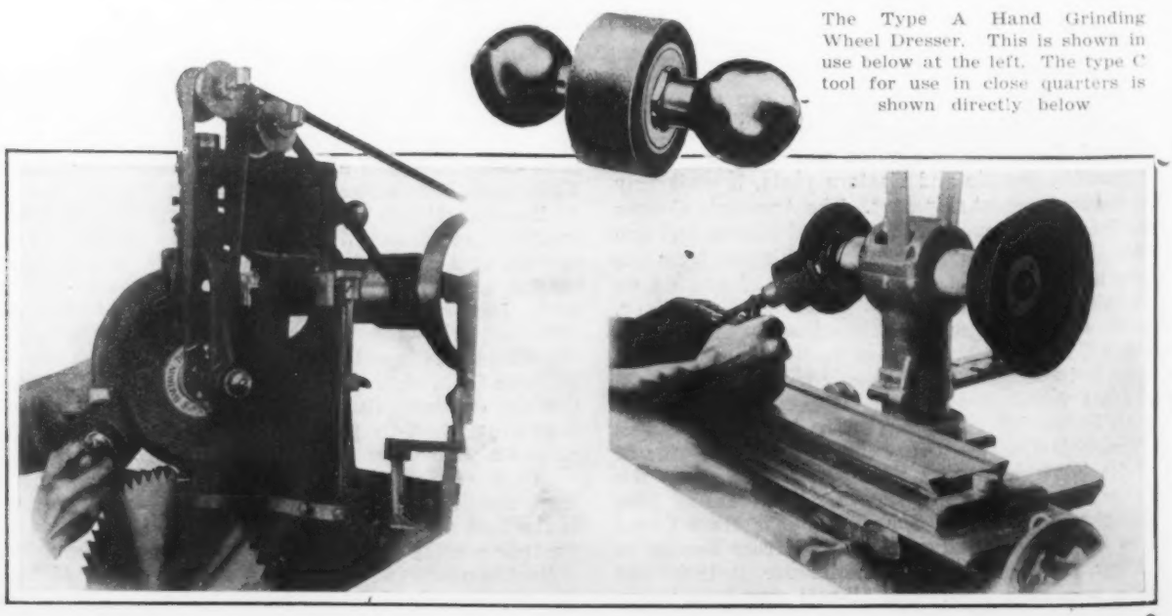
A Feature of the New Rickert-Shafer Collapsible Top Is the Method of Withdrawing the Chasers When the Work Is Tapped to the Required Depth

Hand Grinding Wheel Dressers

The Metcalf grinding wheel dresser is now being marketed by the Oliver Machinery Co., Grand Rapids, Mich. The dresser consists of a 1 x 1½ in. wheel which freely revolves on an adjusted axis. It is designed primarily for fine wheels 1 in. or less in thickness, and will turn a bevel or V-edge or true up a square edge. It can be used to supplement the work of a diamond dresser on large coarse snagging wheels when a smooth grinding surface only is wanted.

The dresser is made in three types. The type A dresser as shown in the detail view in the accompanying illustration is equipped with two iron balls, which are held in the hands when the dresser is in use, as in the left hand view. The right hand view shows the type C dresser, designed for working in close quarters. For working in extremely close quarters smaller size wheels can be provided. Another type of dresser known as type B is furnished for dressing with a tool post.

The proposed bridge and tunnel across the Elizabeth River between Norfolk and Portsmouth, Va., would connect two important cities on opposite sides of the Elizabeth River, the inner harbor from Hampton Roads, one of the busiest shipping ports on the Atlantic seaboard. Because of the Navy Yard further up the river, any bridge must necessarily leave the channel unobstructed. For the bridge several designs have been prepared, the cantilever design containing a span of 1850 ft. between tower centers, or 50 ft. longer than the present longest cantilever at Quebec, and 140 ft. longer than the spans of the Forth Bridge in Scotland. Provision is made for vehicles, cars and pedestrians. The two projects have an estimated cost of $20,000,000. They have been developed by the Tyrrell Engineering Co.



The Type A Hand Grinding Wheel Dresser. This is shown in use below at the left. The type C tool for use in close quarters is shown directly below

OCTOBER PIG IRON OUTPUT

Daily Rate 1435 Tons More Than in September

Net Loss of 32 Furnaces But Production Ranks Second in the Year's Record

The October pig iron output would probably have exceeded the year's record made in March had it not been for the blowing out or banking of a large number of furnaces late in the month. The total ranks second for the year and was only exceeded in 1919 by the month of January.

The production of coke and anthracite blast furnaces in October, a 31-day month, amounted to 3,278,104 gross tons, or an average of 105,745 tons per day as compared with 3,129,323 gross tons, or an average of 104,310 tons per day in September, a 30-day month, and with 3,147,402 tons, or 101,529 tons per day in August, a 31-day month. The March output, with which the October production ranks second, was 3,375,907 tons, or 108,900 tons per day. There was a net loss of 32 furnaces, the total in blast on Nov. 1 having been 287 as compared with 319 on Oct. 1. There were three furnaces blown in and 35 blown out or banked.

The production of manganese and iron alloys declined quite sharply, the total having been 34,690 tons, as compared with 39,546 tons in September. Of the October total 25,690 was ferromanganese and 9000 tons was spiegeleisen.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from October, 1919, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
September, 1919	60,954	21,978	82,932
October	41,796	18,319	60,115
November	57,589	22,156	79,745
December	61,815	23,129	84,944
January, 1920	72,015	25,249	97,264
February	75,230	27,490	102,720
March	80,021	28,879	108,900
April	65,168	26,159	91,327
May	68,668	27,644	96,312
June	73,659	27,792	101,451
July	71,954	26,983	98,937
August	72,740	28,789	101,529
September	74,908	29,402	104,310
October	76,260	29,485	105,745

The figures for daily average production, beginning with January, 1914, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1914—Gross Tons

	1914	1915	1916	1917	1918	1919	1920
Jan.	60,808	51,659	102,746	101,643	77,799	106,525	97,264
Feb.	67,453	59,813	106,456	94,473	82,835	105,006	102,720
Mar.	75,738	66,575	107,667	104,882	103,648	99,685	108,900
Apr.	75,655	70,550	107,592	111,165	109,607	82,607	91,327
May	67,506	73,015	108,422	110,238	111,175	68,002	96,312
June	63,916	79,361	107,053	109,002	110,793	70,495	101,451
July	63,150	82,691	104,017	107,820	110,354	78,340	98,931
Aug.	64,363	89,666	103,346	104,772	109,341	88,496	101,529
Sept.	62,753	95,085	106,745	104,465	113,942	82,932	104,310
Oct.	57,361	100,822	113,189	106,550	112,482	60,115	105,745
Nov.	50,611	101,244	110,394	106,859	111,802	79,745	.....
Dec.	48,896	103,333	102,537	92,997	110,762	84,944	.....

The furnaces blown in include one Carrie furnace of the Carnegie Steel Co. and the new furnace of the Pittsburgh Crucible Steel Co. at Midland, designated as No. 3 furnace, both in the Pittsburgh district, and one Low Moor furnace in Virginia.

Among the furnaces blown out or banked are one Niagara furnace in the Buffalo district, N. Y.; the Grumwold furnace and one furnace of the New Jersey Zinc Co. at Palmerton, Pa., in the Lehigh Valley; one Steelton furnace in the lower Susquehanna and one Bethlehem furnace in the Lebanon Valley; two Isabella furnaces of the Carnegie Steel Co. and five furnaces of the Jones & Laughlin Steel Co. in the Pittsburgh district; one Shenango furnace in the Shenango Valley; three Johnston furnaces of the Cambria Steel Co. and one Josephine furnace in western Pennsylvania; the Pulaski furnace in Virginia; one furnace of the Bethlehem Steel Co. in Maryland, and the Norton furnace in Kentucky; one Haselton furnace of the Republic Iron & Steel Co. in the Mahoning Valley; one furnace of the American Steel & Wire Co. in northern Ohio; the Hanging Rock furnace and Jisco furnace, as well as the Sarah, Star, Union and No. 2 Wellston furnaces, all in southern Ohio; one Gadsden furnace and the Tuscaloosa furnace in Alabama; one Allen's Creek furnace, the Chattanooga, Helen, LaFollette and Standard furnaces in Tennessee.

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for October, and the three months preceding:

Pig Iron Production by Districts—Gross Tons

	Oct. (31 days)	Sept. (30 days)	Aug. (31 days)	July (31 days)
New York	240,815	233,534	223,091	212,392
New Jersey	9,118	9,153	8,020	3,764
Lehigh Valley	109,825	100,309	96,310	87,622
Schuylkill Valley	100,757	89,498	83,143	76,614
Lower Susquehanna and Lebanon Valleys	85,821	80,862	67,849	57,863
Pittsburgh district	641,735	651,348	655,191	637,773
Shenango Valley	121,202	121,830	108,949	97,708
Western Penna.	161,972	156,155	183,125	177,866
Maryland, Virginia and Kentucky	116,170	110,097	102,785	99,850
Wheeling district	138,867	126,610	123,047	108,304
Mahoning Valley	306,875	281,785	304,482	297,462
Central and Northern Ohio	301,361	285,842	311,310	304,149
Southern Ohio	65,348	70,042	61,877	55,293
Chicago district	520,217	472,762	462,550	488,790
Mich., Minn., Mo., Wis., Colo., and Wash.	141,028	117,011	118,127	119,629
Alabama	199,656	197,532	212,946	218,227
Tennessee	17,337	24,953	24,600	23,737
Total	3,278,104	3,129,323	3,147,402	3,067,043

Diagram of Pig Iron Production and Prices

The fluctuations in pig iron production from 1910 to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnace at Chicago, and No. 2 X at Philadelphia. They are based on the weekly quotation of THE IRON AGE.

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1916—Gross Tons

	1916	1917	1918	1919	1920
Jan.	3,185,121	3,150,938	2,411,768	3,302,260	3,015,181
Feb.	3,087,212	2,645,247	2,319,299	2,940,168	2,978,879
Mar.	3,337,691	3,251,352	3,213,091	3,090,243	3,375,907
Apr.	3,227,768	3,334,960	3,288,211	2,478,218	2,739,797
May	3,361,073	3,417,340	3,446,412	2,108,056	2,985,682
June	3,211,588	3,270,055	3,323,791	2,114,863	3,043,540
July	3,224,513	3,342,438	3,420,988	2,428,541	3,067,043
Aug.	3,203,713	3,247,947	3,389,585	2,743,388	3,147,492
Sept.	3,202,366	3,133,954	3,418,270	2,487,965	3,129,323
Oct.	3,508,849	3,303,038	3,486,941	1,863,558	3,278,104
10 mos.	32,549,894	32,097,269	31,718,356	25,557,260	30,760,858
Nov.	3,311,811	3,205,794	3,354,074	2,392,350	.....
Dec.	3,178,651	2,882,918	3,433,617	2,633,268	.....
Total, yr.*	39,039,356	38,185,981	38,506,047	30,582,878	.....

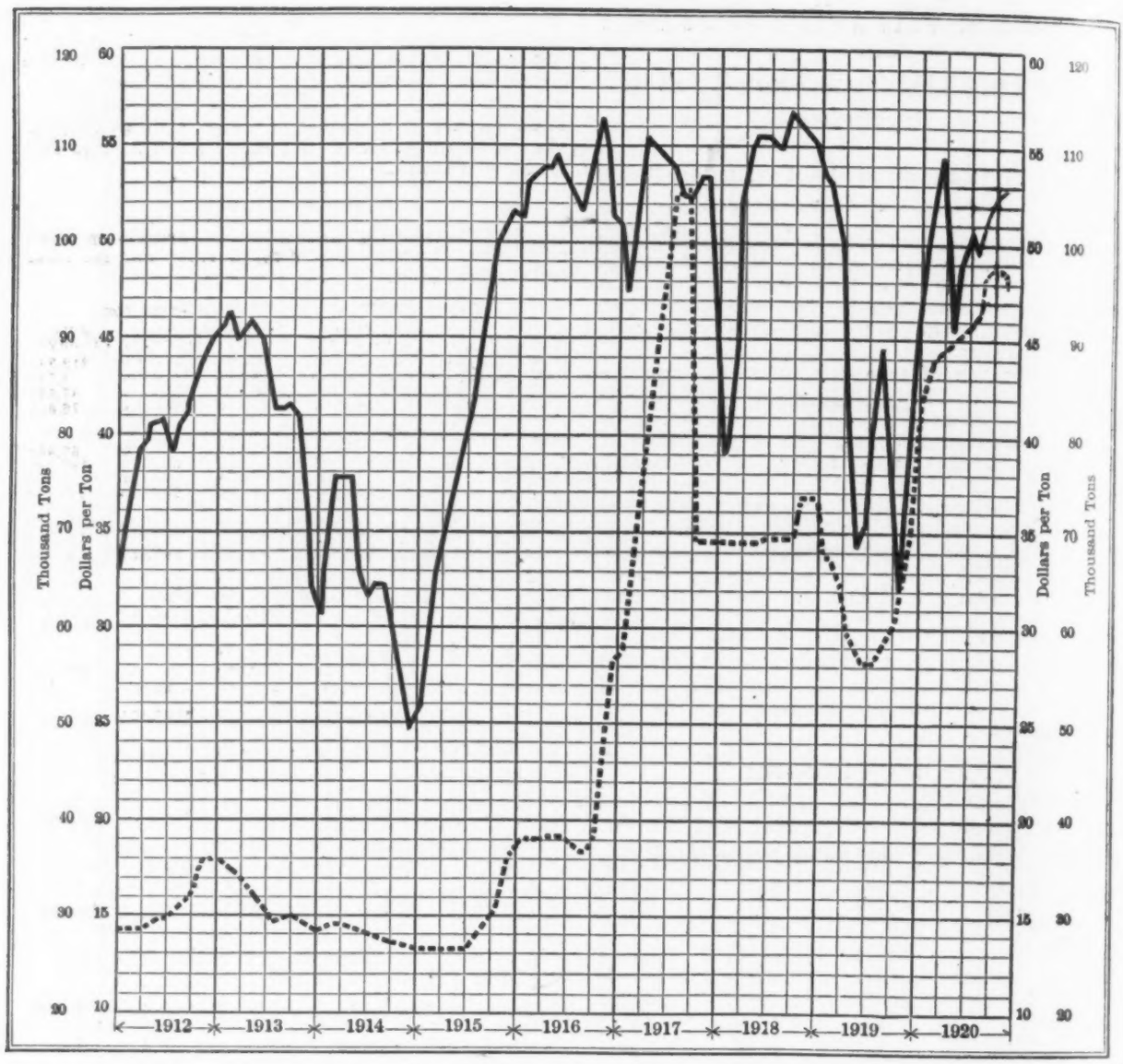
*These totals do not include charcoal pig iron. The 1918 production of this iron was 347,224 tons.

Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies, as well as from merchant furnaces producing ferromanganese and spiegeleisen, show the following totals of steel making iron, month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Ton

	Total production			Spiegeleisen and ferromanganese		
	1918	1919	1920	1918	1919	1920
Jan.	1,756,208	2,430,022	2,232,455	30,695	32,787	23,957
Feb.	1,620,254	2,209,470	2,181,679	26,114	28,105	28,038
Mar.	2,349,419	2,277,507	2,480,668	39,122	26,644	35,275
Apr.	2,411,788	1,838,677	1,968,542	35,511	17,308	27,628
May	2,513,577	1,586,805	2,128,720	54,633	14,604	33,407
June	2,407,166	1,655,944	2,209,770	44,844	14,254	34,751
July	2,456,693	1,906,604	2,230,567	51,762	14,805	36,789
Aug.	2,509,357	2,108,566	2,254,943	54,009	17,419	36,985
Sept.	2,507,381	1,828,613	2,247,250	66,275	20,621	39,546
Oct.	2,594,277	1,295,690	2,364,072	70,379	20,238	34,690
Nov.	2,501,867	1,727,656	.....	59,638	19,964	.....
Dec.	2,524,794	1,916,249	.....	49,435	15,718	.....



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Price Per Ton of No. 2 Southern Pig Iron at Cincinnati, Local No. 2 Iron at Chicago and No. 2X Iron at Philadelphia

Capacities in Blast Nov. 1

The usual table giving the number of furnaces in blast Nov. 1 and their capacity, as well as the number and daily capacity in gross tons of furnaces in blast Oct. 1, is necessarily omitted. The data for Nov. 1 will appear in the production figures for November in the issue of Dec. 9.

St. Lawrence Waterway Hearing

The benefits the Middle West will enjoy if the Great Lakes-St. Lawrence waterway project is carried to completion were set forth at a hearing before the International Joint Commission at Chicago on Oct. 29 and 30. The hearing was one of a series which the commission has arranged in all the principal cities which will feel the effects of the proposed improvement. At the Chicago hearing, evidence was presented showing the amount of business that is done from the productive area of the Middle West, for the moving of which better transportation facilities are needed. Among those who presented briefs was H. C. Barlow, traffic director of the Chicago Association of Commerce, who pointed out that in 1919 Chicago exported more than $1,000,000,000 worth of merchandise and foodstuffs and imported goods valued at more than $45,000,000.

Of interest in connection with the hearings is an exhaustive survey of the waterways project recently completed by Horace C. Gardner, Chicago, for the American Society of Mechanical Engineers. The waterway, he contends, would result in a saving of coal for the United States and Canada of 100,000,000 tons a year by the elimination of much rail hauling to seaboard. He states that the Canadian Government's estimate of the St. Lawrence improvement, exclusive of machinery for power and distribution of power, is $60,000,000 for the international section and $50,000,000 for the Canadian section of the river.

News of Engineering Federation

The Engineering Society of York, Pa., at its meeting on Oct. 18 unanimously decided to apply for charter membership in the Federated American Engineering Societies.

The Washington (D. C.) Society of Engineers at its meeting on Oct. 20 voted also to become a charter member.

D. J. Sterrett has been appointed a delegate to represent the Detroit Engineering Society at the first meeting of American Engineering Council to be held in Washington Nov. 18 and 19. The Buffalo Engineering Society has appointed President W. B. Powell a delegate to this meeting.

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Costs Do Not Make Prices

It has been common to say that prices of various commodities could not come down unless costs of manufacture were first reduced. For months it was preached also that there could be no revision of prices to lower levels unless production could be increased, scarcity being admittedly a large factor in the price advances in a number of important products. As a matter of fact, prices have come down without compliance with either of these theoretical requisites.

In the textile trade and in others in which the ultimate consumer buys over the counter of a store, it is true that the declines came first in the raw materials and that wholesale markets underwent drastic readjustment. But the reductions that have been made in retail prices, most of them moderate thus far, were not the result of a decrease in the actual cost of the goods sold at retail. The dealer's stocks had been bought at high prices and were sold at reductions, going in some cases below cost, because they could be replaced on the dealer's shelves at prices considerably below what he had paid for them. Cost did not determine selling price.

In the iron trade much stress has been put on the high cost of pig iron. Repeatedly in market comment the views of producers have been presented to the effect that costs of manufacture had risen to such a degree that selling prices could not be reduced. One of these expressions in the market review of a selling firm so recently as Oct. 9 was that "when coke declines, then and not until then, can there be a reasonable expectation of any change in the cost of making iron which would justify lower quotations." But the fact is that pig iron started to decline before coke yielded, no considerable change in the spot coke market taking place until two weeks ago. Over and over it has been demonstrated in the changing fortunes of iron and steel markets that cost does not determine selling price; yet each recurring transition from buoyant demand and high prices to hesitation and at length a decline has been marked by the positive assertion at each stage of the reaction that the bottom had been reached, seeing that any further decline would mean going through the cost line.

But what is cost for one producer is often dollars per ton more or less than cost for another. Furnaces which have had their own coke supply have not had their cost made for them in the past year by the soaring prices for spot coke. Therefore, in the readjustment now under way the procedure is not likely to be different from what it has been in other like periods. The high-cost furnaces will stop first; then in turn, if demand should continue to shrink, those next in line. Always in such a procedure is the possibility of an upturn, through the blowing-out movement being carried too far. In the past ten days a good many blast furnaces have stopped. Meantime the downward movement in coke has been sharp and decisive. It is a situation calling for close watching by both buyers and sellers.

Purchasing Agents' Obligations

In steering a manufacturing plant through the present period of business contraction the purchasing department has an important obligation. Ever since the recession began, the lot of purchasing officials has been hard. It has not been easy to readjust the incoming movement of supplies purchased under conditions of uncertain deliveries. Meanwhile demands for a changed policy have come in three different ways,—through banking pressure to reduce inventories to a few weeks' rather than a few months' needs, through a decided betterment in freight movements, putting an end to the apparent scarcity, and through a falling off in sales. Calls for suspensions of deliveries have been frequent, followed by requests for cancellations. These latter have given rise to serious charges of violation of contracts.

It appears, for example, that cancellations have been sought in order that duplicate orders might be placed elsewhere at lower prices than originally obtained. It is not likely that much of

this is attempted, or that purchasing agents do not observe a high code of business ethics. But the one back slip is talked of where the ten forward steps are overlooked. With so much activity in late years on the part of trade associations, it is not to be expected that industrial managers will be allowed to overlook, let alone condone, lapses in contractual obligations. The association movement has brought an enlarged understanding of interrelations in the industrial fabric. Acquaintance with business rivals has gone far to make business competition as clean as that in sports. The news of an unjust act to one of a group spreads rapidly through the rest of it and the transgressing company is sure to hear of an ill-advised move of an employee. It behooves the management to be sure its staff is thoroughly aware of its policy in these trying times. A staff man with a limited horizon not infrequently attempts a saving for his company without regard to its effect.

An important consideration to-day is that expediency must soften strict dealings. Delayed completion of expanded plants in some cases has synchronized with the slump in demand. Summary policies might involve sound companies with the unwise expanders. The situation is not without perplexities and both purchasing and sales departments are called on to steer carefully and with an eye to future as well as to present advantage. There is a loud call that business contracts shall not be regarded as mere scraps of paper.

Extension of By-Product Coking

Every point in George Otis Smith's plea for thrift in coal, presented before the American Iron and Steel Institute meeting a fortnight ago and printed in THE IRON AGE last week, deserves careful attention, but of particular interest is the suggestion that coke or coke oven gas should be used wherever it can be substituted for coal as now burned.

While the idea is not entirely new it is now presented in more forceful manner. The aspect of by-product coking is entirely altered when this viewpoint is taken. The common view of by-product coking has been that there is represented merely the substitution of the by-product or retort oven for the beehive oven. Our total production and consumption of coke is taken and the statistics are studied to ascertain the percentage of the coke that is made or can be made by the by-product process. In other words, when we supply all our regular coke requirements with by-product coke we have a 100 per cent record and the whole work is accomplished.

The coke consumption of to-day is almost wholly metallurgical. Even including gas house coke, which is not ordinarily represented in coke production statistics, but little coke is used for heating purposes. Mr. Smith takes it, however, that of every 1000 tons of coal now mined only 130 tons is coked, whether in beehive or by-product ovens, while a larger proportion, 165 tons, is used domestically, and 350 tons, or almost three times as much, is used in industries. The remainder is made up of railroad fuel, 250 tons; coal used at mines, 35 tons; coal used by gas works, 10 tons, and coal exported, 60 tons.

The by-product ovens now existing could produce possibly 60 per cent of the coke we require according to existing practices, and 60 per cent of the 130 tons is only 78 tons. Taking only one-half of the 165 tons of the domestic coal and the 350 tons used by the industries gives 257 tons, which added to 52 tons for which beehive ovens must still be used makes a total of 309 tons, or four times the amount of coal now carbonized by by-product ovens. Replacing the remaining beehive ovens would raise the present by-product coking from 60 to 100, but replacing one-half the domestic and industry coal would raise it to 240.

A great saving in money is promised. Why, then, is the thing not done? There is less work under way in this direction, and less is contemplated, than has been done in recent years. There are various difficulties. Foremost at the present time is the high cost. Building of by-product ovens represents in particular a long time investment, and the initial cost must be right and in keeping with construction costs that may be developed in the future. The case presents one of the most practical arguments possible for the country's completing as soon as possible a readjustment in prices, labor costs and financial conditions to put it in position to do work on a permanent and safe basis. Even under the most favorable building conditions, however, command of the enormous amount of capital requisite for the undertaking cannot be expected to be easy. The great bulk of the money that has been spent hitherto in by-product oven building has been money earned by those who would be consumers of the coke produced. But little capital has been invested in by-product ovens contemplating the sale of coke and gas in the open market.

Our recent experiences as to coal movement indicate that frequently it will be inconvenient to move coal by rail to suit the varying requirements of domestic and industrial consumers. By-product plants are naturally located at convenient points for distributing coke and gas, and can be built to store large quantities of coal at a minimum of expense. Prospective difficulties in moving coal, therefore, make the aspect of the by-product coke oven more favorable. The field, when capital can be attracted, will be much larger than that suggested by the present consumption of coke.

The tendency in British industry is such that American competition for the steel trade of the world, even for Britain's own markets, is now a "serious menace to one of our own [British] industries." The London *Ironmonger* says further that British wages are now close to the American level and that the costs of producing iron and coal are more than in this country, with loss of British export trade inevitable unless production costs there can be reduced without lowering wages. This seems impossible, says the same authority, in view

of the attitude of labor against increasing output. The maintenance of an American export trade in steel of over 400,000 tons per month nearly two years after the war is thus partly explained. The present situation in Great Britain, amounting almost to stagnation, has been largely brought about by the organized inefficiency of labor—higher wages and less output. No amount of mechanical efficiency can overcome such a handicap. The settlement of a three-weeks coal strike, from which it will take far longer than three weeks to recover, will not prevent forward strides by England's competitors.

German Steel Exports

There is no direct evidence in the form of German statistics of the recovery of the German export trade in steel. There are no figures, indeed, for the production of pig iron and steel. Germany evidently proposes to give no information that can be used in her fuel settlements with France. Our Berlin letter printed elsewhere gives the view that the export trade is much hampered.

However, the other side of the picture is shown in the Dutch import statistics for the first half of 1919 and 1920. Total iron and steel imports into Holland from Germany to July 1, this year, were 233,791 metric tons as compared with 111,660 tons to July 1, 1919, or an increase of over 100 per cent. Among the items rails are first with nearly five times the tonnage of last year, or 47,933 tons as compared with 9948 tons. In merchant bars and shapes the increase is over 150 per cent, while in nuts and bolts and in wire the 1920 figures are nearly four times those of 1919. There has been a great gain in fuel. In the first six months of 1919 the coal imports from Germany were 264,210 tons; this year they expanded to 627,707 tons. In coke the figures are 70,186 tons and 135,675 tons respectively. This does not suggest extreme shortage of fuel in Germany.

The rate of industrial recovery in Germany is likely to be minimized by German officials and naturally competition from that quarter in iron and steel will be accompanied by no advance beating of drums. German initiative and efficiency are certain to be factors in world trade when international finances again tend toward normal.

Capacities of Blast Furnaces

The first regular directory published by the American Iron & Steel Association, dated Sept. 1, 1874, listed 681 blast furnaces. The production of pig iron in 1873 was 2,560,963 tons, and in none of the five years following was this output equaled, so that the average capacity of a blast furnace, without allowance for time out for any cause, may be taken for that period at 3,760 tons per annum, or a trifle over ten tons a day. Allowing for furnaces out of blast and for obsolete furnaces operating under the unusual conditions existing—for pig iron in September, 1873, was two and one-half times the price at which it sold five years later—the average output of the "modern" furnaces of the day may be taken at less than twenty tons daily. At the present time there are 437 furnaces on the potentially active list, disregarding the charcoal furnaces, whose circumstances do not permit outputs comparable with those of the coke stacks, and the total capacity is nearly twenty times the output attained in 1873.

It seems curious that improvements whereby the output of the individual blast furnace is increased should continue to the present day, yet such is the case. It cannot be said that improvement in the art has been continuous year after year, but there have been almost innumerable improvements, and as the adoption of a given improvement has come at various times at different furnaces the increase in the average capacity per stack of the existing furnaces no doubt has been strictly continuous. At times it may have been thought by those not in intimate contact with furnace managers that the current practice at the best plants was not regarded as susceptible of much further improvement, but the fact seems to be that at all times furnace managers have been on the lookout for ideas which would lead to further progress.

Even those wholly unfamiliar with blast furnace practice, but interested in general results, have noted for years past that more often than not individual furnaces from time to time increase their outputs. Those who study the statistics of production have often seen times when the furnaces of the country, in the aggregate, produced more pig iron than was thought possible on the basis of past performance with allowance for new stacks built since the previous performance was recorded. A notable instance of unexpectedly large production was that of the first half of 1916, when 19,619,522 tons was produced. In the first half of 1913 a record of 16,488,602 tons had been made. The few new stacks built in the interim would hardly begin to account for the increase shown in the annual rate, more than 6,000,000 tons. The adoption of the wide hearth by a considerable proportion of the furnaces was mentioned at the time as explaining a large part of the increase.

The subject of the wide hearth was ably presented from a metallurgical standpoint by the recent institute paper of Walter Mathesius, superintendent of the South Chicago furnaces. With widened hearths these furnaces rose from 512 to 556 tons daily, as averages, or almost 10 per cent.

For a development of this sort to occur when the blast furnace is so old and when its problems have been studied scientifically for so long is suggestive that there may be other improvements coming. With the extremely high cost of blast furnace construction it is particularly desirable that the output of the individual stack should be increased. Many of the improvements in blast furnace practice that resulted in increased outputs have shown a decrease in coke consumption per ton of iron, so that the improvement in one direction has not been at the expense of something else. In the case of the furnaces cited by Mr. Mathesius the coke consumption was reduced from 2053 pounds to 2037 pounds.

CORRESPONDENCE

Are the Railroads Jeopardizing Their Interests?

To the Editor: The increase in freight rates to the railroads was granted with the distinct understanding that they would take advantage of the increased revenue to put their roads in the proper condition by placing orders for equipment, etc. These rates have now been in effect over two months, and there has been very little business placed.

As a consequence of the publicity given to the curtailment in automobile production, and its effect on finished iron and steel (though the tonnage is vastly overrated) there seems to be a feeling in some quarters that finished iron and steel prices must be reduced considerably. Those who so judge fail to take into consideration the fact that iron and steel never advanced in proportion to other commodities, and that the price which has been maintained by the United States Steel Corporation is below the cost of production to some independent mills.

Based on pig iron costing $40, delivered, and a cost for steel scrap of $25, delivered, the cost to an independent mill making finished material such as plates and structural shapes is about $2.46 per 100 lb., figuring on the mill running practically full. In other words, there is very little chance of the independent mills being able to exist at a price less than 3c. per lb., and this is based on a full program and on getting pig iron down to $40, which is about $5 below its recent quotation.

Bear in mind that in figuring the above price of finished steel the increase of freight rates alone amounts to nearly $4 per ton.

The feeling is gaining strength in many quarters that if the railroads do not take advantage of the present situation—as the mills would be willing to contract with them to-day at very low figures, thereby stabilizing business—a tremendous demand will spring up from all over the country for a reduction in the present railroad rates.

We believe the public is perfectly satisfied that the railroads should have this increase in freights, providing they do what was promised, and that is to put their roads into proper condition. But unless they do this, and do it at once, we doubt if the public will stand for the high freight rates, particularly in view of the liquidation in every other commodity.

To give examples of what the increased freight rates mean as against pre-war conditions, we give the following table, using a consuming mill at Coatesville and one at Pittsburgh as base points, and showing the increase in the rates per ton on scrap steel over the pre-war figures:

	Pre-War	Present	War Tax	Total	Percentage Increase to Railroad	Percentage Actual Increase to Consumer
Boston to Coatesville	$2.30	$4.90	$0.15	$5.05	113	119
Boston to Pittsburgh	3.00	6.30	0.19	6.49	110	116
Philadelphia to Coatesville	0.80	1.82	0.06	1.88	127	135
Philadelphia to Pittsburgh	2.40	5.32	0.16	5.48	122	128

A MERCHANT.

Philadelphia, Oct. 26, 1920.

Boston Engineers to Hold Anniversary

The Boston section, American Society of Mechanical Engineers, will hold its fortieth anniversary dinner at the Boston City Club on Nov. 5 at 6 p. m. Addresses will be made by John R. Freeman on "Recent Engineering Development in China and the Far East" (illustrated); and Francis W. Dean on "Reminiscences Regarding the Early Days of the Society." Among the other speakers will be Governor Coolidge, Mayor Peters, Boston; Dr. Elihu Thomson, acting president Massachusetts Institute of Technology, and Prof. George I. Alden, representing the Worcester section of the society. Charles T. Main will serve as toastmaster.

DUMPING IN SOUTH AMERICA

Belgium Dumping Material to Obtain Market—Japan Sells at Low Prices in China

Improvement in exchange is no longer looked upon by exporters as the only factor in a resumption of foreign trade. With American exporters temporarily excluded from heavy business because of this and the decline in domestic prices, foreign buyers are again showing their pre-war preference for dealing with England, Germany or Belgium, and these countries, excluded by unsettled conditions in some markets, are said to be dumping material in South America and other markets that have been almost exclusively the field of the American exporter for several years.

According to exporters with connections in South American countries, Belgian producers are consistently underselling American material, and in a partially successful effort to eliminate American competition in England have sold bars and angles as low as $65 per ton, c.i.f. the English port. Some exporters minimize this Belgian competition, claiming that since Belgium has been able to sell for export in any quantity, which was about four to five months ago, few orders taken have been delivered.

Exporters to the Orient report that while Chinese merchants are financially sound and willing to buy American material, Japanese offers at low prices prevent many sales. Mild steel bars have been offered in China by Japan at $75 per ton, c.i.f. port. The Dutch East Indies is still an active market for American exporters, particularly in structural steel, although orders are generally small.

The Iron Age and Its Readers

Of last week's issue of 74 pages, 22 were devoted exclusively to the meeting of the American Iron and Steel Institute. The fact that these engineering, business and economic contributions are not printed by the association for advance circulation makes the publication of special service to those attending as well as to those who could not go.

The editorials in the October issues were intended to be of special service in this period of trying business problems. The titles of some of them will indicate their scope. They include "Prices and Mental Attitudes," "Gold Production and Prosperity," "Against Price Guarantees," "Railroad Investments and Returns," "Deflation and Credits," "Price Guarantees," "Steel Price Tendencies," "Property and Commodity Values," "Iron and Steel Price Alignments," and in this issue "Costs Do Not Make Prices."

Cleveland Cold-Drawn Steel Co. Formed

The Cleveland Cold-Drawn Steel Co., Cleveland, has been formed to build a plant for the manufacture of cold-drawn steel and has acquired a 6-acre site along the Pennsylvania Railroad on Dunham Road. Plans are being prepared for the first unit of the plant, which will be 100 x 400 ft. It is expected that on the completion of this building a heat treating plant will be erected. Officers of the company, which is incorporated with a capital stock of $2,000,000 are Frank R. Kew, now general superintendent of the Crucible Steel Co. of America, president; H. P. Barnard, now general works manager of the Crucible Steel Co., vice-president; A. P. Stressinger of the International Steel Tube Co. Cleveland, secretary-treasurer. These officers with C. H. Hopkins, treasurer of the International Tube Co., and W. W. Wallace, constitute the board of directors. It is announced that the erection of the plant will not be started before spring.

Iron and Steel Markets

THIRTY-TWO FURNACES OUT

Pig Iron Production Cut Sharply Late in October

Producers in All Lines Adjust Operations to Demand—Pig Iron and Coke Lower

Pig iron producers have made a quick response to the falling off in consumption. Thirty-two fewer furnaces were in blast Nov. 1 than one month previous—a falling off that has few parallels.

October production of pig iron held up well, the total being 3,278,104 gross tons, or 105,745 tons a day, as against 3,129,323 tons in the 30 days of September, or 104,310 tons a day. Thus October was the record month of the year, apart from March, and only January showed a larger total in 1919.

Thirty-five furnaces blew out last month and only three blew in, and 287 furnaces were active Nov. 1, against 319 one month previous. Most of the newly idle furnaces were blown out in the past ten days, showing the rapid adjustment of the industry to the falling off in demand.

In pig iron as in steel the Steel Corporation's production has been nearer to capacity than that of other makers, in view of the considerably larger tonnages on its books in all lines.

The policy of limiting mill operations to demand is general. In the Pittsburgh district one large independent producer has put out two blast furnaces in the past week and now has only seven furnaces going, against 12 one month ago. Finishing departments are curtailed in proportion and at various independent plants in Ohio and western Pennsylvania considerable numbers of men are idle. There is no disposition by producers to accumulate either pig iron or steel at high costs, in the face of the present tendency of prices.

While nothing has occurred to change the course of independent steel producers' prices, no new level has developed, in view of the small volume of new business and the lower rate of plant operations. One company sold 1000 tons of tank plates for Ohio delivery at the Steel Corporation's price of 2.65c., mill, and a Western independent mill quoted this price on an attractive specification calling for early delivery. Some other plate mills have quoted 3c., and that was the price on 2000 tons of car plates placed in the East by the Pennsylvania Railroad.

Independent mills have made further reductions in sheet prices. A number of them that were picking quick delivery business a few months ago are now in need of work. Black sheets can be had at 5.50c. for No. 28 and on the heavier gages of blue annealed, sold on the plate basis, as low as 3.90c. for No. 10 has been done.

The determined efforts of some automobile makers to secure revision of their sheet contracts have not brought the expected result. More is heard of the possibility of legal action to enforce certain of these contracts.

Further indication that 1921 will be marked by large rail production is the fact that the Chicago district mill is now booked for almost the entire year. The St. Paul order is for 30,000 tons and that of the Rock Island for 40,000 tons.

In wire products business has fallen off but cancellations have been few, although a good many suspensions have come to independent manufacturers. Most of the latter have live business on their books to carry them through the year.

In leading iron centers, particularly in the East and in the Chicago district, furnaces are showing a disposition to allow resellers of pig iron to have the market to themselves until conditions become more settled. Almost no furnace sales are reported except in the Pittsburgh district, where basic has declined $1.50, Bessemer $3, while lower prices are being made on foundry grades. In the Chicago district, resale Northern iron is obtainable at $6 below recent furnace prices and Southern at $4 below the $42, Alabama furnace quotation, which has long prevailed. Low phosphorus iron has sold at $7 below the furnace price. The largest inquiry was from a Springfield, Ohio, melter for 10,000 tons of foundry grades for early delivery, which it is understood was placed with a Lake furnace. The present attitude of the furnaces indicates a further sharp reduction in output and this may check the fall in prices.

The general rejection of bids on cast-iron pipe by municipal authorities indicates a belief that lower prices will soon be named and there seems to be reason for such action, as pipe prices are out of line with the quotations on resale pig iron.

With furnaces blowing out, coke is more plentiful and another $2 has come off the price, making a decline of about 50 per cent in three weeks. From $9 to $10 has been paid for furnace coke, with a downward trend still indicated.

Resumption of work at British iron and steel plants is expected next week. To-day only 15 Cleveland district blast furnaces are operating out of 71. The possibilities of German competition in exports appear in sales of tin plate for the Far East at the equivalent of 38s., Hamburg, whereas the British price is now 42s. 6d.

Pittsburgh

PITTSBURGH, Nov. 1.

Closing of the gap between independent steel company prices and those of the Steel Corporation has been somewhat slower in the past week than previously, due to a little less anxiety upon the part of the former to secure business. Furthermore, it has been the inclination of most of these factors to complete such liquid business as is on their books and to curtail operations in various departments of the plants. One large Pittsburgh independent company in the past week has blown out two blast furnaces and is steadily slowing down in its finishing departments. A large number of men have been laid off and in comparatively few of the independent plants of this and nearby districts is there anywhere nearly full employment of labor. It cannot be said that the decline in independent steel prices has

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Nov. 1, 1920	Oct. 26, 1920	Oct. 5, 1920	Nov. 4, 1919
No. 2X, Philadelphia‡	*$48.79*	$51.54	$53.51	$33.10
No. 2, Valley furnace†	*42.00*	45.00	47.00	30.00
No. 2, Southern, Cin'ti†	*42.50*	46.50	46.50	32.60
No. 2, Birmingham, Ala.†	*38.00*	42.00	42.00	29.00
No. 2 foundry, Chicago*	*40.00*	43.00	46.00	30.00
Basic, del'd, eastern Pa	46.16	46.16	51.26	28.00
Basic, Valley furnace	*38.50*	40.00	46.00	25.75
Bessemer, Pittsburgh	*43.96*	46.96	50.46	29.35
Malleable, Chicago*	*40.50*	43.50	46.50	29.25
Malleable, Valley	*42.00*	46.00	50.00	29.25
Gray forge, Pittsburgh	*43.96*	45.96	47.96	28.15
L. S. charcoal, Chicago	58.50	58.50	58.50	35.50
Ferromanganese, Atl. port	155.00	155.00	170.00	115.00
Rails, Billets, Etc., Per Gross Ton:				
Bess. rails, heavy at mill	$55.00	$55.00	$55.00	$45.00
O.-h. rails, heavy, at mill	57.00	57.00	57.00	47.00
Bess. billets, Pittsburgh	55.00	55.00	55.00	38.50
O.-h. billets, Pittsburgh	55.00	55.00	55.00	38.50
O.-h. sheet bars, P'gh	62.50	62.50	65.00	42.00
Forging billets, base, P'gh.	65.00	65.00	70.00	51.00
O.-h. billets, Phila	60.74	60.74	60.74	47.50
Wire rods, Pittsburgh	*70.00*	75.00	75.00	53.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	4.85	4.85	4.85	2.895
Iron bars, Pittsburgh	4.75	4.75	4.75	3.00
Iron bars, Chicago	3.75	3.75	3.75	2.72
Steel bars, Pittsburgh	3.00	3.00	3.25	2.50
Steel bars, New York	3.38	3.38	4.13	2.77
Tank plates, Pittsburgh	2.85	2.85	3.25	2.65
Tank plates, New York	3.38	3.38	3.63	2.92
Beams, etc., Pittsburgh	3.00	3.00	3.10	2.45
Beams, etc., New York	*3.38*	3.48	3.48	2.72
Skelp, grooved steel, P'gh.	3.25	3.25	3.25	2.45
Skelp, sheared steel, P'gh.	3.50	3.50	3.50	2.65
Steel hoops, Pittsburgh	5.00	5.00	5.50	3.05

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Nov. 1, 1920 Cents	Oct. 26, 1920 Cents	Oct. 5, 1920 Cents	Nov. 4, 1919 Cents
Sheets, black, No. 28, P'gh.	6.50	6.50	6.75	4.35
Sheets, galv., No. 28, P'gh.	7.75	8.00	8.25	5.70
Sheets, blue an'l'd, 9&10	4.90	4.90	5.00	3.55
Wire nails, Pittsburgh	4.25	4.25	4.25	3.50
Plain wire, Pittsburgh	3.75	3.75	3.75	3.85
Barbed wire, galv., P'gh	4.45	4.45	4.45	4.25
Tin plate, 100-lb. box, P'gh.	$8.50	$8.50	$9.00	$7.00
Old Material, Per Gross Ton:				
Carwheels, Chicago	*$33.00*	$34.00	$37.00	$25.50
Carwheels, Philadelphia	*39.00*	40.00	41.00	25.00
Heavy steel scrap, P'gh	*26.00*	27.00	28.00	21.00
Heavy steel scrap, Phila	*21.00*	22.00	23.00	20.00
Heavy steel scrap, Ch'go	*19.50*	20.00	22.50	18.00
No. 1 cast, Pittsburgh	38.00	38.00	41.00	26.00
No. 1 cast, Philadelphia	*37.00*	38.00	39.00	26.00
No. 1 cast, Ch'go (net ton)	26.00	26.00	30.00	25.50
No. 1 RR. wrot, Phila	27.00	27.00	31.00	27.50
No. 1 RR. wrot, Ch'go (net)	19.00	19.00	21.00	19.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	*$9.00*	$11.00	$17.00	$5.50
Furnace coke, future	12.00	12.00	14.00	6.00
Foundry coke, prompt	*11.00*	13.00	18.00	7.00
Foundry coke, future	13.00	13.00	14.00	6.50
Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*15.00*	15.25	18.25	21.75
Electrolytic copper, N. Y.	*15.00*	15.25	18.25	21.25
Zinc, St. Louis	*6.90*	7.10	7.50	7.55
Zinc, New York	*7.35*	7.50	7.65	7.90
Lead, St. Louis	*6.65*	6.75	7.50	6.50
Lead, New York	*6.90*	7.00	7.50	6.75
Tin, New York	*39.50*	40.25	42.50	56.00
Antimony (Asiatic), N. Y.	*6.37½*	6.50	7.00	8.75

*The average switching charge for delivery to foundries in the Chicago district is 70c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.
The prices in the above table are for domestic delivery and do not necessarily apply to export business.

stopped, but some difficulty is experienced in developing new prices because of the continued paucity of the demand, and the lower rate of plant operations. One Valley steel maker who has been quoting bars at 3.50c. in the past week has dropped to 3.25c., while another, though publicly quoting 3.25c., is said to be in a receptive mood on tonnages carrying a firm bid of 3c.

The decline in pig iron and fuel prices is unchecked. A Valley furnace interest has just closed on 2000 tons of basic for early delivery at $38.50, furnace, a decline of $1.50 from the price of a week ago, and more iron of this grade is available at the same figure. Small lots of Bessemer iron have sold at $42, Valley furnace, and since more of this iron can be had at the same price and demands are few and small, a higher quotation does not seem warranted. This price represents a drop of $3 per ton since a week ago. The scrap market has yielded $1 a ton further, and apparently still is far from the bottom. Coke prices are down $2 a ton from the levels of a week ago, and in spite of a smaller production, due to the observance of a church holiday and the fact that the rabbit hunting season opened in Pennsylvania Nov. 1, consumption is falling at a more rapid rate and predictions are freely made that still lower prices will be seen before the week ends.

Complaints of a shortage of cars continue to be heard and some of the Steel Corporation's subsidiaries have suffered seriously from this condition. The National Tube Co. has piled more finished material since a week ago, and has been obliged to suspend finishing mill operations at its Riverside works, Benwood, W. Va., because of the heavy congestion of pipe resulting from lack of cars. The Carnegie Steel Co. has been forced to stock considerable semi-finished steel and the American Sheet & Tin Plate Co. has accumulated several thousand tons of sheets and tin plate, due to its inability to secure a sufficient supply of cars. It had been expected that the Interstate Commerce Commission, following its recent action rescinding the priority for cars for coal shipments to the Great Lakes, and the fact that several lake ports now are embargoed because of coal congestions, would repeal order No. 20, thus giving access to the steel industry to thousands of open top cars.

Pig Iron.—Aside from a sale of 2000 tons of basic for early delivery, from a Valley furnace, at $38.50, the week has been dull and uninteresting. The circumstances surrounding this transaction are that a regular customer of the seller was offered the iron at $38.50, and this price was met to retain the account. Since the demand for this grade still is on a declining scale and at least two interests were willing to sell at $38.50, a higher quotation hardly is warranted, especially in view of the fact that several of the steel companies have iron for sale and are waiting for buyers to open negotiations. The price of Bessemer iron has been revised downward to meet the changed conditions. While quotation-making tonnages are lacking in the week's business, at least some small lots have been sold at $42, Valley furnace, and sellers who have taken such business say they have more iron for sale at the same price. The market on malleable to-day is not at all well defined, but in view of the fact that sellers would take business at $42, this seems to establish that as the going quotation. On such lots of foundry iron as have sold direct from furnaces, the price has been $45, furnace, for No. 2 grade, but resale lots have gone as low as $42. W. P. Snyder & Co. figure the average price of

Bessemer from Valley furnaces for the month of October at $47.25, and of basic at $42.418. Sales of Bessemer were very few, and this largely accounts for the failure of this grade to follow the drop in basic, the average price of which was influenced by the sale at $38.50.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.96 per gross ton:

Basic	$38.50
Bessemer	42.00
Gray forge	$41.00 to 44.00
No. 2 foundry	42.00 to 45.00
No. 3 foundry	41.50 to 44.50
Malleable	42.00

Ferroalloys.—The market here reflects a weaker undertone and lower prices cannot be given merely because there is not enough business doing upon which to base them. Nominally, domestic 76 to 80 per cent ferromanganese is quoted at $170, Atlantic seaboard, but it would be dangerous for any buyer not in need of tonnages to bid even as low as $140, for some sellers frankly state that they would consider such a bid, it is so long since they had any inquiries, while with decreasing steel works operations, they expect they will have to compete with resale offerings for some time. Moreover, the settlement of the British coal miners' strike is expected to mean increased English competition before long. The market also is softer on spiegeleisen, a carload inquiry in this district recently bringing out quotations of $78 and $80, furnace, the former by a maker who hitherto has been quoting average 20 per cent material at $80, and the latter by a company which has been publicly quoting $82.50. We revise our quotations accordingly, for while no sales are reported, the market cannot be quoted any higher than prices at which makers are willing to sell. Quotations on Bessemer ferrosilicon mean almost nothing as far as sales are concerned and to do any business makers would have to cut prices at least $5 per ton to compete with resale offerings. The problem of makers of electrolytic ferrosilicon is not merely one of price, but where they can find customers.

We quote 76 to 80 per cent ferromanganese nominal at $170, seaboard, for either domestic or English material on direct sale, with makers open to firm offers of $20 to $30 per ton less; resale tonnages, $155 to $160, seaboard. We quote average 20 per cent spiegeleisen nominal at $78 to $80, furnace and 50 per cent ferrosilicon nominal at $75 to $80, furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson County and New Straitsville, Ohio, furnaces as follows: 9 per cent, $66; 10 per cent, $69.50; 11 per cent, $72.80; 12 per cent, $76.10. Silvery iron, 6 per cent, $56.50; 7 per cent, $58; 8 per cent, $60; 9 per cent, $62; 10 per cent, $64.50; 11 per cent, $67.80; 12 per cent, $69.80. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Structural Material.—The American Bridge Co. has taken 300 tons for bridge No. 57 of the Sandusky division of the C. C. C. & St. L. Railroad. This constitutes the only award of any consequence that has recently come to shops in this district. The market in general is extremely dull and improvement is not expected in the near future. Plain material reflects conditions both in the building industry and with manufacturers of railroad equipment. Independents generally are quoting a base of 3.10c., but it is believed this price would be shaded as much as $4 a ton on attractive business. Prices are given on page 1237.

Billets and Sheet Bars.—The situation is purely conjectural in the absence of important sales. Open market activities are even more limited now than they were recently and some makers state they do not know where prices are. It is well established that standard analysis 4 x 4 in, rerolling billets are not quotable at above $60, Pittsburgh or Youngstown, as that is as high as the independent makers now quote. How much this price would be shaded on attractive tonnages cannot be stated owing to the lack of such inquiries. Generally, independent companies claim they are holding to $65 for sheet bars, but that figure has not been obtained recently and in view of the passing of the fancy prices recently obtainable on prompt tonnages of sheets and tin plate, some doubt is expressed that sales could be made to-day at $60. The independent market in both forms is sustained less by the current demands than by the fact that producers are gaging production closely by their orders and their own requirements. Independent steel works operations in Pittsburgh and adjacent districts do not average more than 60 per cent of capacity, if, indeed, they run that high. Demand for forging billets is exceedingly light and buyers have much to say as to prices.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at $38.50 to $60; 2 x 2-in. billets, $42 to $63.50; Bessemer sheet bars, $47 to $65; open-hearth sheet bars, $47 to $65, and forging billets, ordinary carbons, $65 to $70 base, all f.o.b. Youngstown or Pittsburgh mill.

Wire Rods.—Independent makers still are holding to $75 for rods rolled on order, but admit that sales of this sort lately have been few and small and that on stock material $70 is maximum on ordinary soft rods. Some demand still is coming out for carbon rods, and specifications against bolt rods are fairly good. The chain makers are less insistent for tonnages and this is true also of the nonintegrated makers of common wire products. Prices are given on page 1237.

Wire Products.—Business continues to taper off, but cancellations have been few, although a good many suspensions have come to the independent manufacturers. Most of the latter have sufficient live business on their books to carry them over the remainder of the year, and since they are not actively seeking business beyond that period, the recession in independent prices is slower than most other lines of finished steel. A reduction in the spread between independent and Steel Corporation prices is considered likely before the end of the year.

We quote wire nails at $3.25 base, as the price of the American Steel & Wire Co., and $4.25 to $4.50 by independent mills. We quote bright basic wire at $3.25, the price of the American Steel & Wire Co. and $3.75 to $4, the price range of the independent mills.

Plates.—There has been no increase in the demand upon independent companies and what they might accept on desirable business can only be conjectured. Some of them still are quoting 3.25c., but it is doubtful whether any would refuse 3c., and buyers claim to have had tonnages offered at 2.90c. A Middle Western company is reported to have gone to the Steel Corporation base of 2.65c. A Pittsburgh independent now rolling against a Canadian order, placed at 3.25c., has announced its intention of shutting down its plate mills when this order is completed. The Carnegie Steel Co. has been operating its plate mills practically 100 per cent in the past week, and has had fairly good success in the matter of shipment. However, it is not yet accepting new business for shipment this year.

We quote sheared plates of tank quality, ¼ in. and heavier for early delivery from independent mills at 2.85c. to 3.25c. Pittsburgh. The Carnegie Steel Co. still quotes 2.65c. and is accepting business at that figure, but is not guaranteeing early delivery.

Sheets.—While requests for cancellations of high-priced tonnages have been common from the automobile manufacturers, no considerable success has attended this effort and independent companies which have been called into conference with the Ford Motor Co. are strong in their assertions of their intention to make that company live up to its obligations. Suspensions against shipments to the automobile builders have been heavy, and there is a possibility that vigorous action will be necessary to make these interests take the tonnages they have bought. General demand for sheets is slow and those who have tonnage for sale for delivery over the next few months are obliged to give much consideration to buyers' price ideas. Independent mill operations are about 80 per cent of capacity and the leading interest is running at about the same rate, although hampered by less than normal supply of sheet bars and the fact that its shipments have been curtailed through a scarcity of cars. Resumption at the Bellaire, Ohio, works of the Carnegie Steel Co. is expected to result in a better supply of sheet bars for several of the plants of the American Sheet & Tin Plate Co. Prices are given on page 1237.

Tin Plate.—The American Sheet & Tin Plate Co., it

is now officially announced, will not open its books until the early part of next month. While there is no indication that the company contemplates an advance in prices, it wants to be thoroughly conversant not only with its own order books but with general conditions before announcing its position. Business remains light and prices show no change.

We now quote tin plate to domestic consumers at $7 to $8.50 base box; stock items, $8.50 to $9, and for export $10 to $11 per base box, all f.o.b. Pittsburgh.

Steel Rails.—Light rails rolled from new steel are being offered at 3c. by some makers, who hitherto have been quoting 3.25c. The market no longer appears to be quotable on sales at higher than 3.50c., as that price recently has not been exceeded. All makers are promising early deliveries, as new business lately has been running much lighter than completed tonnages. Small sales of standard sections for prompt shipment out of stock are reported to have been made at a base of $75, mill, for Bessemer rails.

We quote 25 to 45-lb. sections from 2.45c., the price of the Carnegie Steel Co., to 3c. to 3.50c., the range of the independent makers rolling from new steel; 16-lb. and 20-lb. sections are priced 4½c. per 100 lb. higher than the base sizes, 12-lb. and 14-lb. sections 9c. per 100 lb. above base and 8-lb. and 10-lb. sections 13½c. per 100 lb. above base. Standard sections, 50 lb. and heavier, are quoted by the Carnegie Steel Co. at $45 for Bessemer and $47 for open hearth stock and by independent mills from $55 to $65 for Bessemer and $57 to $67 for open hearth rails.

Iron and Steel Bars.—The Crucible Steel Co., which recently came into the market for business and on large tonnages accepted the Steel Corporation price of 2.35c. base, appears to have secured any business that was obtainable, as other independent companies report an extremely slow market. Estimates of the bookings of bars by this company run as high as 25,000 tons, but the company declares that they were considerably less than half that total. Some of the business was at 2.35c., some at 2.75c., and some at 2.90c. This company now is quoting 3c. to 3.25c. This range covers what other independent companies are quoting. Makers of iron bars in this district have made no changes in prices, but admit a considerable decline of the demand.

We quote steel bars rolled from billets at 2.35c., this being the price of the Carnegie Steel Co. for very indefinite delivery, likely not before first quarter of next year. Other mills rolling steel bars from billets quote from 3c. to 3.25c. at mill, prices depending entirely on the buyer and the delivery wanted. We quote reinforcing bars, when rolled from billets, at 3.25c. to 3.50c., and from old steel rails at 3c. at mill. We quote common iron bars at 4.75c. and refined iron bars at 5c. to 5.50c. in carloads, f.o.b. mill, Pittsburgh.

Cold-Finished Steel Bars.—Apparently the readjustment in the automobile industry is not making the expected progress, as demands and specifications from that quarter remain exceedingly light. Other consumers are not pressing for supplies, apparently expecting further recessions in prices in keeping with the downward trend of prices of hot-rolled bars. Shipments of the latter by the Steel Corporation and carrying the corporation base of 2.35c. are heavier and makers thus served have somewhat lower raw material costs than recently. The effect, however, is slight owing to the low rate of plant operations by makers of cold-finished bars. The market is quotable from 4c. to 4.25c., base, but only a little tonnage is moving at the top figure, cancellations having created some surplus, while a number of contracts were revised as to prices to keep them alive. One large maker reports that the bulk of his current shipments carry the old base of 3.60c.

Hot-Rolled and Cold-Rolled Strips.—Several makers still are holding to the old bases of 5.50c. for hot-rolled and 8.50c. for cold-rolled and claim to be making fair-sized sales at those figures, but others are quoting $10 per ton less and say that they are not flooded with new orders. The more general condition is that order books were riddled by the slump in the automotive industry and new business from that or other consuming sources has more than slightly repaired the loss. The market also has lost the prop of high cost raw materials and is feeling the effect of resale offerings by both consumers and speculators, and in the case of cold-rolled strips by the fact that the American Steel & Wire Co., which is quoting 6.25c. base, is more of a factor in the supply than it was a short time ago.

Hoops and Bands.—Demand remains at an extremely low ebb and all quotations find little basis in actual business. A large independent maker here is quoting 5c., but admits that no business has been done recently at that figure. Some makers who want business are said to be quoting from $10 to $20 a ton below that price.

Nuts, Bolts and Rivets.—Makers gradually are making inroads upon their old orders and with shipments against such business on a heavier scale, new demands are fewer and smaller than they have been. This means that sales at the higher prices are smaller than they have been. The supply situation in iron cap and set screws is easier as a result of the depression in the automobile business.

Iron and Steel Pipe.—Illustrative of the extremely tight supply in oil country goods is the experience of the Prairie Pipe Line Co., which put before independent makers an inquiry for approximately 40,000 tons of line pipe and was able to secure only about 3 per cent of the tonnage. Demand, both the domestic and export, for oil country pipe remains upon an enormous scale and present bookings of all companies are sufficient to keep them busy far into 1921. Orders for standard pipe are sufficient to keep the plants going full for six to eight months. Scarcity of open top cars still hampers fulfillment of obligations by manufacturers, but improvement in this direction is expected before long, as it is believed that following the recent repeal of Order No. 10 by the Interstate Commerce Commission, Order No. 20, which gives the coal mines priority on cars with sides of 38 in. and higher, will be revoked. The National Tube Co. has been obliged to stock more pipe in the past week on account of the scarcity of open top cars, and it has larger unshipped tonnages now than during the worst period of the railroad paralysis. Riverside works of company has been forced down because of the heavy congestion of finished material, due to the scarcity of cars. Prices and discounts are given on page 1237.

Spikes.—A number of inquiries, all calling for early delivery, are noted for standard railroad spikes. A fair demand also is reported for small spikes. Fairly prompt delivery now is being promised by makers, few of whom have as big a backlog of orders as they had a short time ago. Prices are given on page 1237.

Coke.—The decline in the coke market continues, and spot tonnages of furnace grade now are available at about half the prices of three weeks ago. While some operators were making something of a stand today at $10 per net ton, oven, for this grade of coke, using the argument that the opening of the rabbit hunting season and the observance of a church holiday had affected oven operations and production, others were offering tonnages at $9.50, and sales were made of selected brands at $9 flat. While the market is quotable from $9 to $10, based on actual sales, it was freely predicted that an $8 market would be seen before the end of the week. Since coal is coming down in price almost as rapidly as coke, the coke operators cannot ship coal to advantage, and with consumption of coke on the decline, expectation of still lower prices seems well founded. Even at the decline, coke still shows a liberal margin of profit, and the buyer with an order can come pretty near making the prices so long as there is a margin for the producer. Spot foundry coke is held as high as $12 and $12.50 by some middlemen, but the producers' market hardly is quotable much higher than $11, and there were offerings of 72-hr. fuel to-day as low as $10. The contract market on both grades is nominal, owing to the lack of important transfers. Although some coal operators were quoting gas coal for domestic use at $7, minimum, buyers claimed no difficulty in securing tonnages at around $6 and resale or distress lots at steep concessions from the latter figure.

Old Material.—Prices continue to slide as a result of the fact that melters not only are out of the market as far as new purchases are concerned, but in many instances are refusing to take in overshipments against contracts even at a sharp concession from the contract price. The market, however, is hardly as weak as some

dealers, who have short sales to cover, picture it and comment is made upon the fact that the flood of offerings which usually comes out on a declining market largely is absent at present. Possibly this may be due to the fact that the Pennsylvania Railroad is not granting permits at all freely for scrap shipments, but with shipments over other roads into this district unhampered in this respect, the more common tendency is to ascribe the relatively light offerings to the liquidated condition of supplies. Most grades of open hearth material are down at least $1 per ton from the prices of a week ago, with heavy melting grade now quoted at $26 to $26.50 and some melters report having been offered tonnages at even less. Railroad wrought grade is down about $3 per ton from the recent level, as $27 delivered was the top realized on recent sales by the railroads. The Pennsylvania Railroad, Eastern Region, is offering 19,895 gross tons of old material in its November list, bids against which must be in by Nov. 9.

We quote for delivery to consumers' mill in the Pittsburgh and other districts that take Pittsburgh freight rates as follows:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, deliv.	$26.00 to $26.50
No. 1 cast (for cupola)	38.00 to 39.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	38.00 to 39.00
Compressed sheet steel	21.50 to 22.00
Bundled sheet sides and ends, f.o.b consumers' mills, Pittsburgh, dist.	17.00 to 17.50
Railroad knuckles and couplers	27.00 to 27.50
Railroad coil and leaf springs	27.00 to 27.50
Railroad grate bars	27.50 to 28.00
Low phosphorus melting stock (bloom and billet ends, heavy plates, ¼ in. and heavier)	33.00 to 34.00
Railroad malleable	32.00 to 33.00
Iron car axles	52.00 to 53.00
Locomotive axles, steel	44.00 to 45.00
Cast iron wheels	40.00 to 41.00
Steel car axles	40.00 to 41.00
Rolled steel wheels	27.00 to 27.50
Machine shop turnings	15.50 to 16.00
Sheet bar crop ends (at origin)	28.00 to 29.00
Heavy steel axle turnings	21.00 to 22.00
Short shoveling turnings	18.00 to 19.00
Heavy breakable cast	31.00 to 31.50
Stove plate	28.00 to 29.00
Cast iron borings	18.00 to 18.50
No. 1 railroad wrought	27.00 to 28.00

September Wage Statistics

Statistics of employment in industries for September, as compiled by the Bureau of Labor Statistics, Department of Labor, Washington, show that in 98 iron and steel plants 184,805 was the number on the payroll in September, an increase of 2.3 per cent over the number employed in August, and the September semi-monthly payroll amounted to $14,392,181, an increase of 6.3 per cent. These figures indicate roughly that the individual wage payment in September was 4 per cent more than in August. Similar figures for 107 iron and steel plants indicate that the average wage is 16.3 per cent more than in September, 1919.

In 46 automobile plants 115,253 were on the payroll in September, a decrease of 4.5 per cent, and the weekly payroll amounted to $4,035,193, a decrease of 3.2 per cent. Compared with August, 1920, the average wage was 1.3 per cent higher, and compared with September, 1915, 15.6 per cent higher. In 38 car building and repairing plants, the employment in September was 47,195, a decrease of 4.3 per cent, and the semi-monthly payroll was $3,467,664, a drop of 7.5 per cent. In this case the car builders' wages were apparently 3.4 per cent below those of August, but 25.6 per cent above those of September, 1919.

Nelson Company Ordered Sold

Acting on the petition of the receivers in the bankruptcy case of the Nelson Blower Co., whose factory is on Elkins Street, South Boston, Mass., Judge Bingham, in the Federal District Court recently, ordered the property of the company to be sold at auction not later than the week following Thanksgiving. The company was engaged in the manufacture of gun mounts during the World War, and a year ago, when a receiver was petitioned for, the company was manufacturing tractors.

LOWER VALLEY PRICES

Recessions in Basic Pig Iron, Plates and Sheets —Pipe Active

YOUNGSTOWN, OHIO, Nov. 1.—Further recessions in prices of basic pig iron and plates are noted. Basic iron is quotable from $38 to $42, with tonnage available at the lower price. Owing to the backward market, business in plates is being talked of at 2.85c., though the market is nominally at 3c.

Current pipe demand shows little abatement, and in some cases orders being placed are equal to production, with customers insisting upon deliveries. Unfilled tonnage is likely increasing in the district on such output, with mills engaged into the second quarter of 1921.

The long expected break in the fuel market has materialized and will be an important factor in lowering iron costs. One large industrial consumer expects to get contract coal in quantity shortly at $4 per ton, while spot furnace coke is obtainable at from $10.50 to $11. Just how important this readjustment is in costs may be realized when it is understood one heavy coal consumer has but recently paid $10 per ton for coal in addition to freight charges, which exceeded $3.

In the semi-finished market buying is being done cautiously in view of apparently authentic reports of $60 sheet bar business for several thousand tons. Because of curtailed operations or temporary suspensions, sheet bar consumers are fairly well stocked and have reduced specifications against contracts. With more cars available, there will be freer movement of this class of material from makers' yards. Slabs and billets are quotable at $60, with the smaller sizes of billets ranging higher, to $65. A sale of open-hearth sheet bars, involving a small tonnage, is reported below $60.

In view of sustained lull in sheet buying, price weaknesses are discernible, with the buyers controlling the market and producers, especially the newer makers, scrambling for business. Stock lists have appeared, offering attractive prices, but have failed to act as a stimulant to new buying. Blue annealed is softer, and while the mills are not generally quoting under 5c., sales are reported at 4.50c. base. Black sheets, likewise, are softer and a buyer could probably get a quotation of 6c. on a round tonnage, though the nominal price is still 6.50c. to 7c. base.

Revocation of the coal priorities order last week is expected to release large numbers of open-top cars to the industry, which are sorely needed for movement of certain classes of material, especially pipe. To expedite movement, one large interest has adopted the expedient of shipping pipe in box cars where possible, though this involves extra expense for loading and unloading, which is readily absorbed by the buyer.

A fabricator is figuring on a big water-power line for California, contract to be awarded within a short time. This project involves a heavy tonnage of pipe and plates, the diameter of the line at its greatest extent to be about 12 ft.

The minimum on galvanized is probably around 7.75c., with the spread up to 8.25c. Deliveries in less than 30 days are offered by some makers on all three grades. While the larger interests are still well committed, their rolling schedules will stand realignment and new business is very favorably considered.

There has been a softer tone in the strip steel market. The leading district interest is offering 30-day delivery on hot strip, quoting 5.50c. base, and six weeks on cold rolled at 8.50c.

No substantial tinplate bookings for 1921 production are reported in the district, though plenty of business is in sight. New tonnage is commanding $8.50 to $9 per base box. Contracts are usually placed by certain large canning interests after the first of the year, and there is an abundance of business in sight.

Conduit producers are engaged to capacity, while wire product makers are drawing wire to the extent of capacity. The market level on wire rods is $75.

With cars hitherto diverted for lake coal movement available for steel shipments, only a short time will be required to clear the accumulation of about 2000 carloads which gathered in the past two weeks.

New York

NEW YORK, Nov. 1.

Pig Iron.—Selling of resale iron has continued and furnaces seem to be perfectly willing to allow the resellers to have the market to themselves until conditions become more settled. In the Buffalo market, particularly, a very large tonnage has been offered for sale and more than 5000 tons has been sold at $43. There is not as much reselling of eastern Pennsylvania iron as there is of Buffalo, and usual quotations range from $42 to $45. Very little is heard of Virginia iron. The tonnage of charcoal offered for resale is small. Foundries continue to be fairly busy on old contracts, but very little new business is coming in. There seems to be no prospect of export movement increasing at any time in the near future.

We quote for delivery in the New York district as follows, adding to furnace prices $2.52 freight from Eastern Pennsylvania, $5.46 from Buffalo and $6.16 from Virginia:

East. Pa., No. 1 fdy., sil. 2.75 to 3.25	$47.52 to $50.52
East. Pa., No. 2X fdy., sil. 2.25 to 2.75	45.77 to 48.77
East. Pa., No. 2 fdy., sil. 1.75 to 2.25	44.52 to 47.52
Buffalo, sil. 1.75 to 2.25	47.46 to 48.46
No. 2 Virginia, sil. 1.75 to 2.25	49.16 to 50.16

Ferroalloys.—The ferromanganese and spiegeleisen markets are entirely controlled by resale offerings. Although the quotation of producers is still unchanged on the basis of $170, seaboard, for either foreign or domestic alloy, there have been sales of resale alloy at $155, but this has been in small volume and there is very little from any source. Imports for September are reported to have been 6524 tons. The spiegeleisen market is inactive with the quotation largely nominal at $75 to $80, furnace, for the 18 to 22 per cent grade, but resale metal is available as low as $60. The manganese ore market is also quiet, with quotations ranging from 45c. to 50c. per unit. Imports in September were 88,422 gross tons which, with the 99,601 tons imported in August, makes the total for the two months the largest in a long period. Ferrosilicon, 50 per cent, is inactive and quiet at $75 to $80 per ton, delivered.

Cast Iron Pipe.—The bids for 4400 tons of pipe for the city of Columbus, called for Oct. 19, were all rejected. Pipe makers are watching with interest the decline in raw materials, pig iron and scrap. Some admit that lower prices of pipe are a possibility in the near future. In all except the larger sizes makers have enough orders to keep them busy the rest of the year. We quote f.o.b. New York, 6 in. and larger, $77.22; 4 in., $87.22; 3 in., $97.22, with $2 additional for Class A and gas pipe.

Warehouse Business.—Heavy shipments continue to be received from mills, and several warehouses have rented temporary additional space to accommodate this increase in stocks, which, however, does not include any large range of sizes. Quotations on beams and channels and angles, 3 in. by ¼ in. and larger, have been reduced by most warehouses 20c. per 100 lb., making the price 4.30c. per lb. Changes in sheet prices by warehouses, including the foremost independent, have brought blue annealed sheets to 7c. per lb. for No. 10. Dealers in small lots of a few sheets have reduced No. 10 blue annealed to 8c. per lb., No. 28 black sheets to 9.50c. per lb., and No. 28 galvanized sheets to 11c. per lb. Steel wire is off 2c. per lb. and quotations on brass and copper sheets, etc., have been dropped 1c. per lb. We quote prices on page 1248.

High Speed Steel.—The price of $1.25 per lb., New York, for 18 per cent tungsten high speed steel is nominal, a great number of sales now being made in the neighborhood of $1.15 to $1.20 per lb. Producers, however, are not making long time contracts at these prices.

Finished Iron and Steel.—New business is chiefly in small lots, but so little that the week stands out as one of exceptional dullness. The largest item covers about 2700 tons of plates bought by the American Locomotive Co., all of which is believed to have been placed at less than 3c., Pittsburgh. The chief unsettling report is that about $5,000,000 worth of steel bars, sheets and plates now lie in the New York harbor intended for export shipment but held up indefinitely because of the exchange situation. Bankers, it is said, expect that by the turn of the year, unless the financial obligations are met meanwhile, all this material, which must evidently total 50,000 tons, will be dumped on the market. It remains that some small lots for export have been bought, over 100 tons of universal plates, for example, going at 3.25c., Pittsburgh basis. In fabricated steel lines the American Bridge Co. has been awarded 300 tons for the Cheswick power plant, near Pittsburgh, 400 tons for the Huntington Broad Top Railroad, and 450 tons of I-bars for Bartlett, Hayward & Co. For the Times Square postoffice, West Thirty-eighth street, the Government is in the market for 300 tons of steel. A few other sizable jobs have been practically closed, but details are not forthcoming. The Pennsylvania Railroad is expected in the market shortly for 1000 refrigerator cars and 1500 box cars. Though not based on transactions, it appears likely that a sizable tonnage of plain structural material could easily be bought at 3c., Pittsburgh.

We quote for mill shipments, New York, as follows: Soft steel bars, 2.73c. to 3.38c.; plates, 3.03c. to 3.38c.; shapes, 2.83c. to 3.38c.; bar iron, flats, wider than 6 in., 5.38c., with half extras; light rounds, squares and flats, 5.88c., with full extras, and other sizes, 4.88c., with half extras.

Old Material.—The gradual decline of prices continues. There is no demand for heavy melting steel in eastern Pennsylvania, though a little goes to Pittsburgh at not more than $24, delivered. Especially low prices are securable by brokers on cast scrap, one broker having bought several hundred tons of No. 1 machinery cast for $33.75, f.o.b. New York. One broker, in his typewritten summary for the week, expresses the situation: "No buying has developed and the market seems to be on the toboggan." He has reduced buying prices from 50c. to $3 in a week.

Buying prices per gross ton, New York, follow:

Heavy melting steel	$17.50 to $18.00
Rerolling rails	29.50 to 30.00
Relaying rails, nominal	55.00 to 56.00
Steel car axles	28.00 to 29.00
Iron car axles	43.00 to 44.00
No. 1 railroad wrought	22.50 to 23.00
Wrought iron track	18.50 to 19.00
Forge fire	10.00 to 13.00
No. 1 yard wrought long	19.00 to 20.00
Light iron	8.00 to 9.00
Cast borings (clean)	17.00 to 17.50
Machine-shop turnings	12.50 to 13.00
Mixed borings and turnings	12.00 to 12.50
Iron and steel pipe (1 in. diam., not under 2 ft. long)	16.00 to 17.00
Stove plate	22.50 to 23.00
Locomotive grate bars	23.00 to 24.00
Malleable cast (railroad)	22.00 to 23.00
Old car wheels	35.00 to 36.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery cast	$37.00 to $37.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	36.00 to 37.00
No. 1 heavy cast, not cupola size	27.00 to 28.00
No. 2 cast (radiators, cast boilers, etc.)	27.00 to 28.00

Philadelphia

PHILADELPHIA, Nov. 1.

Bars, shapes and plates are now freely quoted by independent mills at 3c., Pittsburgh. On shapes and plates this figure has been shaded on sizable transactions, the minimum so far apparently being 2.90c., Pittsburgh. The decline in bars during the past week or two amounts to $5 a ton. In other steel products there is little or no change, but demand is so light as to scarcely test the market. The Pennsylvania Railroad paid 3c., Pittsburgh, on 2000 tons of car plates for prompt shipment, but declined to place another 1000 tons, partly boiler steel, because mills would not quote as low on boiler plates as on tank quality plates.

In pig iron the recession in prices is all the more pronounced because of the very small amount of business that is being done. Some furnaces with full order books will not quote at all, but others are beginning to shade prices, but without much result in getting orders. At least a few carloads of foundry iron has been sold by an Eastern furnace at $46, furnace, and basic is to be had at $45, furnace. A buyer could do even better,

however, by buying basic from the Pittsburgh district, where it is offered at $39, furnace, plus a freight rate of $5.46 to this district. Some Eastern furnaces are prepared to quote fairly low prices if by so doing they could bring out any business, but the lack of interest on the part of buyers does not encourage the making of open quotations at lower figures.

The past week has been one of the quietest ever experienced in this market.

Pig Iron.—In the absence of any business worthy of note, the market prices of pig iron must be regarded in the light of what producers are willing to sell for. Basic pig iron continues to show weakness, and is now obtainable from the Pittsburgh district at $39, furnace, which, with the freight rate of $5.46, makes a delivered price in eastern Pennsylvania of $44.46. A little less than 1000 tons or resale basic iron has been sold at about $44, delivered. Eastern furnaces quote $45, furnace, on basic, but there is no doubt a better price could be got by any buyer willing to make a firm offer. Eastern Pennsylvania foundry iron is obtainable on the basis of $46 to $48, furnace, and Virginia iron has been sold at $46, furnace. About 500 tons of resale Virginia foundry iron went at $45, Virginia furnace. Malleable iron is quoted by an eastern Pennsylvania furnace at $50, furnace. There is no change in low phosphorus iron, which nominally is quoted at $60 for the copper free and $57 for the copper bearing, f.o.b. furnace. The Midvale Steel & Ordnance Co. has put a furnace at Coatesville on merchant iron and will, make basic, foundry or standard low phosphorus, as may be required by its trade. The Pulaski furnace at Pulaski, Va., is out for relining, and probably will not be again in blast until the first of the year.

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace.

East. Pa. No. 2 plain, 1.75 to 2.25	$47.54 to $49.54
East. Pa. No. 2X, 2.25 to 2.75 sil.	48.79 to 50.79
Virginia No. 2 plain, 1.75 to 2.25 sil.	51.74 to 52.74
Virginia No. 2X, 2.25 to 2.75 sil.	52.99 to 53.99
Basic deliv. Eastern Pa.	44.46 to 46.54
Gray forge (nominal)	47.10 to 48.50
Standard low phos. (f.o.b. furnace)	60.00
Malleable	51.50 to 52.40
Copper bearing low phos. (f.o.b. furnace)	57.00

Ferroalloys.—Ferromanganese is quoted at $150 for resale and $170 from the makers, c.i.f. Atlantic seaboard. Spiegeleisen is nominally quoted at $80, furnace.

Semi-Finished Steel.—There is no interest among buyers, but open-hearth rerolling billets could be obtained at $50 to $55, Pittsburgh, and forging billets at $65 and upward, Pittsburgh, depending on quality.

Plates.—The principal sale of the past week was 2000 tons of car plates to the Pennsylvania Railroad for prompt delivery. The business went entirely to independent mills in the Pittsburgh district at 3c. On 1000 tons or more of plates wanted by a locomotive company, 2.90c., Pittsburgh, is reported to have been quoted by some independent mills. The Pennsylvania Railroad has indefinitely postponed the purchase of an additional 1000 tons of boiler plates and car plates, probably because of the fact that mills were not willing to go as low as 3c. on boiler steel. These plates will be bought in small lots as required. There is very little business in sight for Eastern plate mills, and some of them are running at not more than 50 per cent of normal.

Structural Material.—Plain material is now to be had at 3c., Pittsburgh, and an occasional lot, it is reported, is being sold at 2.90c. Business is extremely quiet.

Bars.—Some mills, which have been quoting 3.25c., Pittsburgh, on steel bars, are now willing to sell at 3c., on desirable specifications. Very little business is being offered. Bar iron is nominally held at 4.50c., Pittsburgh, by some producers, though obtainable at 4c. to 4.25c. from others.

Old Material.—Prices continue to decline because of lack of demand on the part of consumers. Heavy steel scrap is now $21 to $22, and other grades are off 50c. or $1 a ton from last week's quotations. We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$21.00 to $22.00
Steel rails, rerolling	34.00 to 35.00
No. 1 low phos., heavy 0.04 and under	32.00 to 33.00
Car wheels	39.00 to 40.00
No. 1 railroad wrought	27.00 to 28.00
No. 1 yard wrought	24.50 to 25.50
No. 1 forge fire	14.50 to 16.00
Bundled skeleton	15.50 to 16.00
No. 1 busheling	20.00 to 21.00
No. 2 busheling	17.00 to 18.00
Turnings (short shoveling grade for blast furnace use)	17.00 to 18.00
Mixed borings and turnings (for blast furnace use)	16.00 to 16.50
Machine-shop turnings (for rolling mill and steel works use)	18.00 to 19.00
Heavy axle turnings (or equivalent)	20.00 to 21.00
Cast borings (for rolling mills)	22.00 to 23.00
Cast borings (for chemical plants)	24.00 to 25.00
No. 1 cast	37.00 to 38.00
Railroad grate bars	28.00 to 29.00
Stove plate (for steel plant use)	25.00 to 26.00
Railroad malleable	27.50 to 28.50
Wrought iron and soft steel pipes and tubes (new specifications)	20.00 to 21.00
Iron car axles	35.00 to 37.00
Steel car axles	35.00 to 37.00

Birmingham

BIRMINGHAM, ALA., Nov. 1.

Pig Iron.—The week preceding the election was as quiet, so far as sales of pig iron are concerned, as the several preceding ones. Iron masters had given up for the time being all consideration of the future market and were not figuring whether it would be a lower one or one perpetuating present price levels. One furnace interest admits making some yard accumulations this month, owing to the receipt of hold-up requests, but other makers say there is very little of this being done. Production is now four stacks less than it was several weeks ago. The Alabama Co. blew out one stack at Gadsden for relining and Holt stack of the Central Iron & Coal Co. is also out. Sheffield went out some time ago and the Sloss-Sheffield company has blown out its active stack at Sheffield. The Alabama Co. will be able to operate one stack on the production of coal at its Lewisburg mines, where operations have regained to a sufficient extent. This company has now joined the other Alabama operators in completely ignoring the United Mine Workers of America, following strikes declared by their miners at Brookwood and Searles, with which union they had what was known as Blue Book contracts. Plenty of coal for steam purposes is now being mined and industrial operations in the district are doubly safe following the beginning of a slowing down process.

We quote per gross ton f.o.b. Birmingham district furnaces, the Tennessee company included, as follows:

Foundry, sil. 1.75 to 2.25	$38.00 to $42.00
Basic	38.00 to 41.00
Charcoal	60.00

Cast Iron Pipe.—Dullness in the cast iron pipe market has become more pronounced, although the leading interest has several industrial contracts under consideration. It is believed the recent advance of schedule for water and gas pipe will be reduced from $74 back to $70. Not all makers followed the lead of the United States company in announcing that advance. Both Talladega pipe shops are down and several of the new ones are nearing the end of orders. Price concessions are being made in some quarters by interests new in the business.

Coal and Coke.—Coal production has reached a weekly average of 270,000 tons, which is as much as was being mined prior to the general mine strike called Sept. 7. Less than 5000 miners are actually idle. Coke is much easier. The inquiry for 1921 is rather brisk and the contract schedule for standard foundry for 1921 is $12.50 to $13.50, with spot at $14 to $16. There is plenty of furnace coke at $10 to $11.

Old Material.—The scrap market has become so dull that dealers are not trying to do business and will not

do so until after the election. Even the reduced price schedule is a nominal one, so little business is being transacted.

We quote per gross ton f.o.b. Birmingham district yards, prices to consumers, as follows:

Old steel rails	$19.00 to $20.00
Heavy melting steel	18.00 to 19.00
No. 1 cast	30.00 to 32.00
Car wheels	29.00 to 31.00
Tram car wheels	28.00 to 30.00
No. 1 wrought	19.00 to 20.00
Stove plate	20.00 to 21.00
Cast iron borings	9.00 to 10.00
Machine shop turnings	9.00 to 10.00

Boston

BOSTON, Nov. 1.

Pig Iron.—The lowest price noted of resale iron is that at a base price of $40.50, Buffalo furnace, for silicon 1.75 to 2.25, the actual sale having been made in iron, silicon 2.75 to 3.25, at $43.50. Yet with resale iron nearly $10 under furnace prices, there is but little demand, buyers being unusually cautious. The terms, "psychological stagnation," are frequently used to describe the present when consumers are generally not overstocked, but refuse to buy because of their state of mind. A conditioned sale, reminiscent of olders days when politics had more bearing on business, is that of a builder of stationary engines, who will order a certain tonnage if Harding is elected. Several foundrymen say they do not want pig iron to decline and will be glad when resale material is out of the market, since cheaper iron makes their customers clamor for lower priced castings. There are instances where furnaces are not making deliveries on low contract iron, for to do so would mean a loss. Many foundries are reducing working forces, the reduction averaging perhaps one-fifth of the force. The most common resale figure is $43, furnace, base.

Eastern Pa., sil. 2.25 to 2.75	$48.31 to $49.31
Eastern Pa., sil. 1.75 to 2.25	47.06 to 48.06
Buffalo, sil. 2.25 to 2.75	48.71 to 49.71
Buffalo, sil. 1.75 to 2.25	47.46 to 48.46
Virginia, sil. 2.75 to 3.25	52.58 to 53.58
Virginia, sil. 2.25 to 2.75	50.83 to 51.83
Virginia, sil. 1.75 to 2.25	49.58 to 50.58
Alabama, sil. 2.75 to 3.25	52.66 to 55.66
Alabama, sil. 2.25 to 2.75	50.91 to 53.91
Alabama, sil. 1.75 to 2.25	49.66 to 52.66

Coke.—The renewing of contracts is being accomplished much more slowly this fall than usual. Formerly coke salesmen started booking renewals Oct. 1 and had them completed in two weeks, but this year coke buyers hesitate. In view of the drop in coke in the Connellsville district the past two weeks New England buyers are watching with interest what the leading New England by-product coke maker will do with price adjustments, due the first of each month. If any change is expected it is downward. New England users are well covered, but local spot coke is being shipped in fair tonnages to Canada, New York and New Jersey. Contract prices for October have been: Last half, delivered to New England points with a freight rate of less than $3.40, $22.70; first half, $21.70, prices adjusted on a sliding scale with reference to the cost of coal.

Iron and Steel.—After several weeks of no inquiries, three or four feelers for structural steel appeared at the close of last week. Though the contemplated buildings have been before the trade previously, revival usually indicates the coming to life of a buying mood. More is heard of the shading of prices. Shapes have been sold by independents at as low as 2.90c. and 2.80c., the general price being 3.10c. Bars have sold at less than 3.25c. Good deliveries can be made on nearly all products except tin plate. More cancellations have appeared, some freely admitting the action was taken in the expectancy of lower prices. A tonnage of rerolling billets recently sold at $45, though $55 is more general. Forging billets range from $70 to $75, Pittsburgh.

Warehouse Business.—There has been a general price revision downward, amounting to about 50c. per 100 lb. This brings the base price of bars to 5c. per lb. Business is improved as orders are more numerous and a larger tonnage involved in each. The less the thickness of the steel, the greater the scarcity, due to the greater amount of labor involved in the making. This scarcity applies particularly to black and galvanized sheets, tin plate, wire products, bands and hoops.

Jobbers now quote: Soft steel bars, $5 to $7.50 per 100 lb. base; flats, $6 to $6.35; concrete bars, $5; tire steel, $6 to $6.50; spring steel, open hearth, $10; crucible, $15; steel bands, $8 to $8.25; steel hoops, $9; toe calk steel, $7.50; cold-rolled steel, $8 to $10; structural, $4.50 to $6.50; plates, $4.75 to $5.25; No. 10 blue annealed sheets, $7.25; No. 28 black sheets, $9.15; No. 28 galvanized sheets, $10.50; refined iron, $5 to $7.50; best refined, $7; Wayne, $9.50; band iron, $8; hoop iron, $9; Norway iron, $20.

Old Material.—The Bethlehem Shipbuilding Corporation recently sold from New England yards 250 tons of heavy melting steel at $18.50, but this was better than average quality. To this price the buyer must add 50c. a ton to get it hauled to the main line of a railroad. The market price has dropped 50c. a ton on heavy melting the past week. About $24 is the highest price obtainable, delivered Pittsburgh, for steel; also $21 eastern Pennsylvania. A tonnage of steel at $24.50, Pittsburgh, was recently canceled. Though there is but little demand for cast scrap, dealers usually hold out for about $41, delivered New England points.

No. 1 heavy melting steel	$16.00 to $17.00
No. 1 railroad wrought	22.00 to 23.00
No. 1 yard wrought	19.00 to 20.00
Wrought pipe (1 in. dia., over 2 ft.)	15.00 to 16.00
Machine shop turnings	12.00 to 13.00
Cast iron borings	15.00 to 15.50
Heavy axle turnings	13.00 to 14.00
Blast furnace borings and turnings	11.00 to 12.00
Forged scrap	10.00 to 11.00
Bundled skeleton	10.00 to 11.00
Street car axles	28.00 to 30.00
Car wheels	34.00 to 35.00
Machinery cast	37.00 to 38.00
No. 2 cast	35.00 to 36.00
Stove plate	24.00 to 25.00
Railroad malleable	25.00 to 26.00
Rerolling rails	28.00 to 29.00

Cleveland

CLEVELAND, Nov. 1, 1920.

Iron Ore.—The ore situation has eased up considerably and many of the ore firms which have been behind on their shipment schedules all the season have caught up on shipments. The decreased demand for pig iron and steel and curtailment in blast furnace operations has resulted in some resale ore coming on the market and one lot of 15,000 tons of ore for making foundry pig iron was sold during the week. Figures showing October shipments have not yet been tabulated, but it is estimated that the movement for the month will exceed 8,000,000 tons, making shipments to Nov. 1 over 52,500,000 tons. The easing in the ore situation is partly due to cancellations and the deferring of shipments, good dispatch of lake boats during October and to the fact that the grain movement is light, resulting in fewer boats being diverted to the grain trade than had been expected. Cancellations and holdups so far amount in the aggregate to only a rather small tonnage. In some cases, stocks at furnaces are lower than at this time last year, but these furnaces have larger stocks on the docks than a year ago.

We quote delivered lower Lake ports: Old range Bessemer, $7.45; old range non-Bessemer, $6.70; Mesaba Bessemer, $7.20; Mesaba non-Bessemer, $6.55.

Pig Iron.—The market shows a little more life than during the few previous weeks, but activity is confined almost wholly to foundry iron. Considerable resale foundry iron is still going on the market, but most owners of this do not seem inclined to make sharp cuts in prices. However, sellers as a rule are asking for offers. Local furnaces are still adhering to $47 a ton for foundry iron, although sales are being made at $45 in the Valley, or $2 below recent prices. Some interests feel that it is as well to hold to present prices until the resale iron is absorbed and that lower prices at present would not stimulate buying. Foundries that are buying pig iron are generally placing orders for only small lots as needed. We note the sale of 500 tons and 100 tons of foundry iron at the $45 base by a Valley furnace for early shipment to two sanitary interests and 2000 tons by a lake furnace to a Michigan con-

sumer, for March-June delivery, the latter subject to prices prevailing at time of shipment. A leading radiator interest late in the week inquired for 2000 tons of foundry iron for Ohio and Indiana plants, and it is understood to have covered for the greater part or all of its requirements with resale iron. Small lots of resale Southern iron have brought $41. A few of the smaller foundries have ordered pig iron shipments resumed and furnaces have resumed some other shipments that were held up for 60 days, but there has been no general increase in the melt in the Central West. One large local foundry making automobile castings is shut down and another is operating at 35 per cent of capacity. The holdup of shipments will result in a great deal of iron being carried over until next year.

We quote delivered Cleveland as follows, based on the new freight rates, these being a 56c. switching charge for local iron, a $1.96 freight rate from Valley points, a $3.36 rate from Jackson and $6.67 from Birmingham:

Basic	$41.96
Northern No. 2 fdy., sil. 1.75 to 2.25	$46.96 to 47.56
Southern fdy., 2.25 to 2.75	49.92
Ohio silvery, sil. 8 per cent	61.36 to 63.36
Standard low phos., Valley furnace	56.00

Bolts and Nuts.—A weakness has developed in small nuts and large bolts. The easing in prices on the former is attributed to the large cancellations by automobile builders and on the latter by the light demand from the railroads. Manufacturers are getting little new business, but plants are still well filled with old orders.

Small machine bolts, rolled threads, 25 to 10 per cent off list; same sizes in cut threads, 25 per cent off list; larger and longer sizes, 25 per cent off list; carriage bolts, smaller and shorter, rolled threads, 20 and 10 per cent off; cut threads and larger and longer sizes, 20 per cent off list; lag bolts, 40 per cent off list; plow bolts, Nos. 1, 2 and 3 head, 25 per cent off list, the 20 per cent extra for other style heads being unchanged; machine bolts, both smaller and shorter, and larger and longer sizes, 10 per cent off list; hot pressed sq. and hex. blank nuts, 50c. off list; tapped nuts, list; cold pressed sq. and hex. blank nuts, list plus $1; semi-finished hex. nuts, 40 per cent off list.

Coke.—Coke prices continue to decline. Sales of standard Connellsville furnace coke are reported at $10 and $10.50 and a $9.75 quotation is now being made. In the total absence of inquiries, no quotations on foundry coke are available.

Semi-Finished Steel.—There is no new demand for semi-finished steel and sheet bars are still being held up by sheet mills. In the absence of sales $60 is generally considered the market on sheet bars.

Finished Iron and Steel.—With a declining market, consumers are placing orders for small lots of steel and some buyers are purchasing for only a week's requirements. Considerable business is being held up for lower prices and some of this will probably not be released until it is believed the bottom has been reached. The demand is mostly for steel bars, which are generally quoted at 3.25c., and at which some sales in lots from a carload to 100 tons are being made. However, some of the mills are badly in need of orders and there are persistent reports of quotations on steel bars close to the Carnegie Steel Co.'s prices. Some fairly good steel bar business recently held up by agricultural implement manufacturers has been released, and at least some of this without a readjustment in prices. Plates are weak, with quotations by independent mills generally ranging from 3c. to 3.25c., but a 2.90c. price has appeared. In structural lines the Mt. Vernon Bridge Co. was the low bidder on 2500 tons of steel for the Belle Isle bridge, Detroit, and a Detroit contractor the low bidder on the substructure, which will require 2000 tons of sheet steel piling. Hard steel reinforcing bars are inactive and are generally quoted at 3.50c., but this price could probably be shaded. Active inquiries are pending in this market for 12,000 to 15,000 tons of steel rails for next year's delivery.

Cleveland warehouses quote steel bars at 3.34c. to 3.84c.; plates, 3.64c. and structural material, 3.44c.; No. 9 galvanized wire, 4.70c.; No. 9 annealed wire, 4c.; No. 28 black sheets, 8.50c.; No. 28 galvanized, 9.50c.; No. 10 blue annealed, 6.75c.

Sheets.—Prices on black and blue annealed sheets have been further reduced by independent mills and with a falling off in the demand some mills are badly in need of orders. This is particularly true of mills that were taking early shipment orders at maximum prices a few months ago. Black sheets are now freely quoted at 5.50c. to 6c. for No. 28 and blue annealed at 4.25c. to 5c. for No. 10. Quotations on the heavier gages of blue annealed sheets on the plate basis are becoming more general. Sales are reported at 3.90c. for No. 10. We quote galvanized sheets at 7.50c. to 7.75c. for No. 28. Automobile body sheets are inactive, with the quotations unchanged at 7.85c.

Old Material.—Generally the market is weak, although prices stay at about recent levels. Activity is confined almost wholly to purchases by dealers to cover orders placed by the McKinney Steel Co. Dealers are finding it difficult to make shipments to this plant as permits are required and not many permits are being issued, and there has been considerable congestion of cars at the McKinney plant recently. Dealers are paying $25 to $25.25 for heavy melting steel scrap for the McKinney plant when the scrap is loaded on cars and prompt delivery is assured. Otherwise, this grade is around $24. A leading Canton consumer has held up scrap shipments for an indefinite period owing to reduced plant operations. We note the sale of 2000 tons of No. 2 railroad wrought to a Cleveland dealer at $24.

Dealers quote delivered consumers yards in Cleveland and vicinity, as follows:

Heavy melting steel	$24.00 to $25.00
Steel rails, under 3 ft	27.00 to 28.00
Steel rails rerolling	33.00 to 34.00
Iron rails	31.00 to 32.00
Iron car axles	41.00 to 42.00
Low phos. melting scrap	26.00 to 27.00
Cast borings	16.00 to 16.50
Machine shop turnings	11.75 to 12.00
Mixed borings and short turnings	16.00 to 16.50
Short turnings for blast furnaces	16.00 to 16.50
Compressed steel	21.50 to 22.00
Railroad wrought	26.00 to 26.50
Railroad malleable	30.50 to 31.00
Steel axle turnings	21.00 to 21.50
Light bundled sheet stampings	14.00 to 14.50
Drop forge flashings over 10 in.	17.50 to 18.00
Drop forge flashings under 10 in.	17.50 to 18.00
No. 1 cast	30.00 to 32.00
No. 1 busheling	17.00 to 17.50
Railroad grate bars	28.00 to 29.00
Stove plate	27.50 to 28.00
Cast-iron wheels	39.00 to 40.00
Pipes and flues	22.00 to 22.50

St. Louis

ST. LOUIS, Nov. 1.

Pig Iron.—While there has been an occasional car lot sale, the pig iron market has been otherwise dead during the past week and there is little or no expectation of improvement for some days to come, perhaps weeks. Furnace representatives are being advised of furnaces going out of blast and other steps indicating an indisposition to make commitments until greater stabilization is effected. Users of pig iron are apparently well covered for the rest of the year.

Coke.—Oven representatives report that their quotations for best selected 72-hr. coke is $15 per ton for 1921 contracts and $16 for immediate shipment orders, but little or no business is passing. There were, during the week, reports of furnace coke at as low as $11 per ton.

Finished Iron and Steel.—The finished products market remains quiet with the business on existing contracts coming forward more and more freely as the railroad operations improve. The principal interest has made no changes in price at this point and information is that no change will be made until the independents, who are still making higher prices, but making no deliveries on new business, offer concessions which bring them in line with or below the chief interest. Warehouses report good business with supplies coming in more satisfactorily with each week and customers taking all that can be obtained.

We quote for stock out of warehouse as follows: Soft steel bars, 4.07½c.; iron bars, 4.50c.; structural material, 4.17½c.; tank plates, 4.37½c.; No. 10 blue annealed sheets, 7.27½c.; No. 28 black sheets, cold rolled, one pass, 8.20c.; No. 28 galvanized, black sheet gage, 9.70c.

Old Material.—The scrap market is still dull and weak with practically no trading except on small lots or under existing contracts, although on the latter there is increasing disposition to request that ship-

ments be held back until later and also toward a much more severe inspection of delivered scrap. No lists came out during the week, and the values of material, while really lower, show no great quotable change as there is not enough business to establish figures.

We quote dealers' prices, f.o.b. consumers' works, St. Louis industrial district, as follows:

Per Gross Ton

Old iron rails	$30.00 to $30.50
Old steel rails, rerolling	32.00 to 32.50
Old steel rails, less than 3 feet	21.00 to 21.50
Relaying rails, standard section, subject to inspection	40.00 to 45.00
Old car wheels	33.00 to 34.00
No. 1 railroad heavy melting steel scrap	18.50 to 19.00
Heavy shoveling steel	18.50 to 19.00
Ordinary shoveling steel	19.00 to 19.50
Frogs, switches and guards cut apart	19.00 to 19.50
Ordinary bundled sheet	10.50 to 11.00

Per Net Ton

Heavy axle and tire turnings	12.00 to 12.50
Iron angle bars	27.00 to 27.50
Steel angle bars	19.00 to 19.50
Iron car axles	35.00 to 35.50
Steel car axles	29.00 to 29.50
Wrought arch bars and transoms	30.00 to 30.50
No. 1 railroad wrought	19.50 to 20.00
No. 2 railroad wrought	18.50 to 19.50
Railroad springs	19.00 to 19.50
Steel couplers and knuckles	19.00 to 19.50
Locomotive tires, 42 inches and over, smooth inside	17.00 to 17.50
No. 1 dealers' forge	16.00 to 16.50
Cast iron borings	9.50 to 10.00
No. 1 busheling	17.50 to 18.00
No. 1 boilers, cut to sheets and rings	14.00 to 14.50
No. 1 railroad cast scrap	29.00 to 29.50
Stove plate and light cast scrap	22.50 to 23.00
Railroad malleable	21.00 to 21.50
Agricultural malleable	20.00 to 20.50
Pipes and flues	14.00 to 14.50
Railroad sheet and tank scrap	12.50 to 13.00
Railroad grate bars	19.50 to 20.00
Machine shop turnings	7.50 to 8.00
Country mixed scrap	14.00 to 14.50
Uncut railroad mixed scrap	15.00 to 15.50
Horseshoes	23.00 to 23.50
Railroad brake shoes	17.00 to 17.50

Buffalo

BUFFALO, Nov. 1.

Pig Iron.—Sales of furnace iron dropped off considerably last week with an almost entire absence of inquiry. The general decline of business is noticeable in numerous requests for cancellation of tonnage on the part of foundries. Furnaces are refusing all applications of this character, on the ground that they must insist on delivering iron at scheduled prices when this iron has been made under the handicap of heavy costs. Some concessions in the matter of extended delivery are being made, but this is all. The reduction in coke prices cannot affect the price of iron already contracted for, furnacemen say. Resale iron figured in the selling to the extent of about 3000 tons. Of this 250 tons of foundry was sold for $46.25, but lower prices are reported.

We quote f.o.b. Buffalo, as follows:

No. 1 foundry, 2.75 to 3.25 sil.	$45.25 to $49.25
No. 2 X foundry, 2.25 to 2.75 sil.	43.50 to 47.50
No. 2 plain, 1.75 to 2.25 sil.	42.25 to 46.25
Basic	40.00
Malleable	46.00
Lake Superior charcoal	58.00 to 60.00

Warehouse Business.—There has been a reduction of 60c. to 70c. in the price of No. 28 black sheets. The quotation is now $8.50. Business is quiet, though there is some buying on the part of Canadian customers.

Finished Iron and Steel.—The week has been very quiet with inquiry at a minimum and buying small. Mill interests are confident there is business, but that it is being held up temporarily. Inquiry for bars, plates and shapes is extremely light. Inquiry for wire products and pipe is strong and has continued in steady volume. Mill interests are convinced that buyers believe the present liquidation in so many lines must eventually extend to the steel market and there is a tendency to await the 3c. level, but so far, though it is reported there has been some 3c. shapes taken, the instances are isolated and in general the market continues firm. Mills believe that when the demand comes it will come strongly, so that the leading interest with its low-price standard will be unable to take care of all of it, which will result in the independent interests contracting heavily, at their own prices. The car situation is still acute, but mills are hopeful of the embargo on high sided open equipment being lifted presently, with the result that about 2000 additional cars per day will be available for steel shipments.

Warehouse prices f.o.b. Buffalo are: Steel bars, 4.65c.; shapes, 4.15c.; plates, 4.30c.; No. 10 blue annealed sheets, 7.15c.; No. 28 black sheets, 8.50c.; No. 28 galvanized sheets, 10.60c.; hoops, 6.60c.

Old Material.—The market is very weak. There is practically no demand and sales are infinitesimal. Mills will not buy and display no interest in the trend of the market. Transactions are limited to dealers and there has been some impetus to this kind of trading due to the fact that a local mill has embargoed shipments into its plant until future notice. The shipments are on an order placed several months ago, and upon which shipping has been steadily made until this time. With this mill opposing further receipts of heavy melting steel, considerable of this grade is now on the market and is being quoted by dealers at $23 to $24. Even at this price there are no sales of consequence, and other prices have been swept downward, though those quoted are nominal.

We quote dealers' asking prices per gross ton, f.o.b. Buffalo as follows:

Heavy melting steel, regular grades	$23.00 to 24.00
Hydraulic compressed	20.00 to 21.00
Low phos., 0.04 and under	32.00 to 32.50
No. 1 railroad wrought	30.00 to 31.00
No. 1 machinery cast	37.00 to 38.00
Iron and steel axles	36.00 to 37.00
Car wheels	37.00 to 38.00
Railroad malleable	29.00 to 30.00
Machine-shop turnings	13.50 to 14.50
Heavy axle turnings	18.50 to 19.50
Clean cast borings	17.50 to 18.00
Iron rails	31.00 to 32.00
Locomotive grate bars	22.00 to 23.00
Stove plate	28.00 to 29.00
Wrought pipe	18.00 to 19.00
No. 1 busheling	19.00 to 20.00
Bundled sheet stampings	15.00 to 15.50

Cincinnati

CINCINNATI, Nov. 1.

Pig Iron.—The market is practically at a standstill. The only sizable inquiry to come before the trade last week was from a Springfield, Ohio, consumer for 10,000 tons for early delivery. Furnaces generally in this district quoted on a $45, furnace, basis, but it is understood that the order was placed with a Lake furnace. Other sales noted include a 200-ton lot of malleable to a melter in this district at $47, southern Ohio furnace, and 100 tons of Northern foundry at $46, southern Ohio furnace. Reports are current that $38 iron is available in the South, and a report is also current of an independent steel company selling foundry iron at $37, Birmingham. Furnaces feel that in a market like the present nothing would be gained by cutting prices and are holding to the present schedules, but there is plenty of resale iron at $4 under furnace quotations. The dullness in the market has resulted in several more furnaces being banked and only four stacks are now blowing in the Ashland-Ironton district. In the Jackson-Wellston district, two furnaces continue to operate. A number of furnaces in the South also banked during the week.

Based on freight rates of $4.50 from Birmingham and $2.52 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base price)	$42.50 to $46.50
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	43.75 to 47.75
Ohio silvery, 8 per cent sil.	60.52
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	47.52
Basic Northern (nominal)	45.52
Malleable (nominal)	48.02

Finished Material.—The steel market appears to have adopted a waiting attitude. Very few sales are being made, and these only for small tonnages. It is difficult to get a line on what could be done in the way of prices, as there have been no inquiries of any size before the trade. At this time, it appears as though 3.25c., Pittsburgh, were the absolute minimum for steel bars, with the exception of the Steel Corporation's price, but it is pretty generally agreed that this price could be shaded on a desirable specification. The market for sheets appears to have settled to 6.50c. for black, and 8c. for galvanized, though there are rumors of 6c. and 7.50c. respectively. However, no sales are being made

on which to base quotations. Plates and shapes are very quiet, with prices remaining at about the same level as last reported. The Big Four has not closed on its inquiry for 200 tons of structural steel for bridge repair work. Warehouses report a fair business. Prices on black and galvanized sheets have been reduced by some warehouses $20 a ton, and these are now quoted out of warehouse at 8c. for black and 9c. for galvanized. Prices on other items remain unchanged. Some cancellations of orders are being received by warehouses, but these have not amounted to any considerable tonnage. Jobbers quote:

Steel bars, 4c. base; shapes, ¼-in. and heavier, 4.10c.; plates, 4.50c.; cold rolled rounds, 1½-in. and over, 6.25c.; cold rolled rounds, under 1½-in., and flats, squares and hexagons, 7c. base; steel bands, 6c. base; No. 10 blue annealed sheets, 7c. base; Nos. 14 and 16 blue annealed sheets, 7½c. base; black sheets, 28-gage, 8c.; galvanized sheets, 28-gage, 9c.; wire nails, $4.50 per keg base.

Tool Steel.—The market is very quiet, but prices are holding firm, as 18 per cent tungsten high speed steel is still quoted at $1.25, with a 10 per cent discount for orders over 5000 lbs.

Coke.—The coke market is dull and weak. Connellsville furnace coke has been offered in this market at $10 and foundry at $12. We note a sale of 500 tons of Virginia foundry coke at $13. Due to the number of furnaces, which receive their fuel supplies from the Virginia field, being banked, a number of operators have decided to discontinue the production of coke until such time as the furnaces resume operations.

Old Material.—The scrap market is dull and decidedly weaker, cast scrap being off from $6 to $8 from previous quotations. Buying prices on other items have been marked down on an average of $2 per ton.

We quote dealers' buying prices:

Per Gross Ton	
Bundled sheets	$10.50 to $11.50
Old iron rails	23.50 to 24.50
Relaying rails, 50 lb. and up	47.50 to 48.50
Rerolling steel rails	28.50 to 29.50
Heavy melting steel	17.50 to 18.50
Steel rails for melting	19.50 to 20.50
Car wheels	33.50 to 34.50
Per Net Ton	
No. 1 railroad wrought	20.50 to 21.50
Cast borings	9.50 to 10.00
Steel turnings	8.00 to 8.50
Railroad cast	25.50 to 26.50
No. 1 machinery	26.50 to 27.50
Burnt scrap	19.50 to 20.50
Iron axles	32.00 to 32.50
Locomotive tires (smooth inside)	20.00 to 21.00
Pipes and flues	11.50 to 12.00
Malleable cast	21.50 to 22.00
Railroad tank and sheet	11.50 to 12.00

Chicago

CHICAGO, Nov. 1.

The market is extraordinarily quiet and is complicated by the appearance of further resale material, requests for suspensions of shipments and difficulties in collections. The tendency of prices to soften is more pronounced. A purchase of 1000 tons of tank plates for delivery at an Ohio plant has been made from an independent in that territory at the Steel Corporation price. A Western independent has also met the prices of the leading interest on plates and shapes in the cases of inquiries involving attractive tonnages and specifications. Independent quotations on mild steel bars are in a state of fluctuation. While it is certain that less than 3c., Pittsburgh, can be done, just how much would be conceded cannot be ascertained. So far as can be determined, no independents have opened their books for first quarter. Although they are willing in some cases to take business at the Steel Corporation price to keep their mills running, they do not feel justified in committing themselves for any period ahead at those quotations. A decline in costs is in sight, but unless a material reduction obtains, it is asserted that to take business on the Steel Corporation level will entail a loss.

Of the items which make up costs, fuel is responding most to the influences of the time. Indiana screenings are now available at $3.85, mine, and fuel oil can be obtained at $1.95, f.o.b. refinery. Coke prices are soft and fluctuating, it being reported that furnace coke has been quoted as low as $9, Eastern ovens, and foundry coke at $11.

An increasing amount of resale pig iron is appearing in the market and concessions of $4 to $6 under furnace quotations are common.

Rails constitute an outstanding exception among the various iron and steel commodities. The local mill is now practically committed for the entire coming year, the matter of price being left open in the contracts which are being closed. Among Western lines which have completed arrangements for their 1921 rails are the St. Paul, which has ordered 30,000 tons, and the Rock Island, which has ordered 40,000 tons. Operating conditions in the district are substantially the same as heretofore.

Pig Iron.—Offerings by melters in this district now aggregate such a tonnage that it may be said that resale iron dominates the market. Northern grades are available at as low as $6 below furnace quotations, and Birmingham iron at $4 below. Among the special irons, copper free low phosphorus in resale lots has been sold at $7 below furnace prices and silvery at $3 less than the lowest producer's quotation. The market is exceedingly quiet so far as buying is concerned, the present concern of melters being to reduce their stocks rather than to add to them. It is felt that the resale offerings will have to be absorbed before furnaces will find it possible to add materially to their present bookings. Foundries are bringing pressure to bear on furnaces to accept cancellations, or at least to suspend shipment on undelivered iron. While most furnaces refuse to cancel, some of them are granting suspensions. That furnace quotations have not yet become wholly nominal is indicated by the fact that one sale of 200 tons of foundry for prompt shipment was recently made at $42 base Birmingham. Inquiries for 300 tons of low phosphorus and 300 tons of Bessemer, both for prompt delivery, are before the trade. Northern furnaces are still well booked, but because of restrictions on the movement of coal cars are having difficulty in making some shipments. The modification of the coal car order of the Interstate Commerce Commission is looked for some time this week.

The following quotations are for iron delivered at consumers' yards except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 70c. per ton.

Lake Superior charcoal, averaging sil. 1.50 (other grades subject to usual differentials), deliv. at Chicago	$58.50
Northern coke, No. 1, sil. 2.25 to 2.75	$42.25 to 48.25
Northern coke foundry, No. 2, sil. 1.75 to 2.25	40.00 to 46.00
Northern high phos	40.00 to 46.00
Southern coke, No. 1 foundry and No. 1 soft, sil. 2.75 to 3.25	47.67 to 51.67
Southern coke, No. 2 foundry, sil. 2.25 to 2.75	45.92 to 49.92
Southern foundry, sil. 1.75 to 2.25	44.67 to 48.67
Malleable, not over 2.25 sil.	40.50 to 46.50
Basic	40.00 to 46.00
Low phos. (copper free)	50.00 to 57.00
Silvery, 7 per cent	55.30 to 58.32

Ferroalloys—The market is very quiet, and while resale material has appeared, it has not been in such volume as to warrant separate quotations below. In the absence of business, producers' quotations are nominal.

We quote 75 to 80 per cent ferromanganese, seaboard, $165 to $170; 50 per cent ferrosilicon at $85, delivered; spiegeleisen, 18 to 22 per cent, $80 to $85 furnace.

Plates—The leading interest continues to accept attractive specifications for indefinite delivery, but has not yet opened its books for fourth quarter or first quarter contracts. A few independents show a disposition to meet the Steel Corporation price at least temporarily. An Eastern independent took 1000 tons of tank plates for delivery in Ohio at 2.65c. Pittsburgh and a Western independent has quoted the same price on attractive specifications calling for early delivery. So far as independents are concerned, prices are soft but unsettled.

The mill quotation is 2.65c. to 3.25c., Pittsburgh, the freight to Chicago being 38c. per 100 lb. Jobbers quote 3.78c. to 4.28c. for plates out of stock.

Structural Material—The market is soft and at least one independent has met the Steel Corporation price in the case of attractive inquiries involving early delivery. Just what the ruling independent price on plain material is at the present time is difficult to ascertain. Fabricating business is light. The Orpheum Theatre and office building, San Francisco, involving 875 tons, has been let to Dyer Bros.

The mill quotation is 2.45c. to 3.10c., Pittsburgh, which takes a freight rate of 38c. per 100 lb. for Chicago delivery. Jobbers quote 3.58c. to 4.08c. for materials out of warehouse.

Sheets—The market is still soft so far as independents are concerned but lower quotations than those previously mentioned have not been reported.

Mill quotations are 4.35c. to 5.90c. for No. 28 black; 3.55c. to 4.95c. for No. 10 blue annealed, and 5.70c. to 7.75c. for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight to Chicago of 38c. per 100 lb. The lowest prices are those of March 21, 1919.

Jobbers quote: Chicago delivery out of stock, No. 10 blue annealed, 7.13c.; No. 28 black, 8.10c.; No. 28 galvanized, 9.60c.

Bars.—The ruling independent quotations on bars seem to have settled to a level of 3c., Pittsburgh, and at least one mill has quoted less. Agricultural implement manufacturers who were optimistic over their business prospects only a month or two ago are commencing to feel the movement toward retrenchment by the farmer, and in many cases have curtailed operation to the extent of 50 per cent. Automobile and tractor companies are still attempting to reduce their inventories either through suspension of shipments on undelivered steel or through attempts to resell part of their stocks. Bar iron and rail-carbon steel bar mills still have comfortable bookings, although new business is lighter. The ruling quotation on common bar iron is now 3.75c., Chicago.

Mill prices are: Mild steel bars, 2.35c. to 3.25c., Pittsburgh, taking a freight of 38c. per 100 lb.; common bar iron, 3.75c., Chicago; rail carbon, 3.75c. mill.

Jobbers quote 3.48c. to 3.98c. for steel bars out of warehouse. The warehouse quotation on cold rolled steel bars is 5.90c. for rounds and 6.40c. for flats and squares, an extra of 15c. per 100 lb. applying to orders exceeding 1000 lb. and under 2000 lb. and an extra 35c. on orders up to 1000 lb. Jobbers quote hard and medium deformed steel bars at 4.63c. base.

Rails and Track Supplies.—Although no official word has been issued to that effect, it is generally felt that the Steel Corporation is more likely to advance rails than plates, shapes and bars. In the meantime more rail contracts are being signed by Western roads with the matter of price left open. Present contracts and reservations indicate that local capacity, with normal operating conditions, will be employed throughout 1921. In most cases rail contracts also cover the complementary fastenings.

Standard Bessemer rails, $45 to $55; open-hearth rails, $47 to $57. Light rails, 2.45c. to 3.50c., f.o.b. makers' mills. Standard railroad spikes, 3.35c. to 4c., Pittsburgh. Track bolts with square nuts, 4.60c. to 5c., Pittsburgh. Steel tie plates, 3c. to 3.50c. and steel angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 3.75c. to 4c., f.o.b. makers' mills.

Wire Products.—Although there is a noticeable reduction in buying by retailers, jobbers still find it difficult to accumulate stocks. The leading interest, now back to normal production and enjoying satisfactory railroad service, still finds it difficult to take care of the needs of its customers. While independents have fairly good bookings ahead, they are finding less new business at their prices. At the same time, they have shown little inclination, as yet, to reduce their quotations. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 1237.

Cast-Iron Pipe.—Most current bids on pipe jobs are being followed by rejections. A week ago we reported the rejection of bids on 250 tons by River Rouge, Mich. Since then two further rejections have been made, bids on 250 tons by Ecourse, Mich., and on 1250 tons by Montgomery county, Ohio. Fort Wayne, Ind., will receive bids on 133 tons of 12-in. pipe on Nov. 8.

We quote per net ton f.o.b. Chicago, ex-war tax as follows: Water pipe, 4-in., $88.10; 6-in. and above, $83.10; class A and gas pipe, $4 extra.

Bolts and Nuts.—Although cancellations are still being received in volume now from the agricultural implement manufacturers as well as from the tractor and automobile industries, bolt and nut manufacturers still have a satisfactory backlog. Collections are very difficult, as is true also of other iron and steel commodities. For prices see finished iron and steel f.o.b. Pittsburgh, page 1237.

Jobbers quote structural rivets, 5.08c. to 5.73c.; boiler rivets, 5.18c. to 5.83c.; machine bolts up to ⅞ x 4 in., 20 per cent off; larger sizes, 10 off; carriage bolts up to ⅞ x 6 in., 10 off; larger sizes, 5 off; hot pressed nuts, square tapped and hexagon tapped, list price plus $1.15; blank nuts, list price plus, $1.15; coach or lag screws, gimlet points, square heads, 30 per cent off. Quantity extras are unchanged.

Old Material.—Here and there users have bought small tonnages of scrap, but without halting the downward tendency of prices. Busheling has been bought at $17.50 per net ton, close to 1000 tons of agricultural malleable brought $25 per gross ton, and a few carloads of cast have been absorbed. In the main, however, the market is exceedingly quiet and trading is confined to dealers who are applying purchases on undelivered contracts with consumers. Railroad offerings include the Chicago & Northwestern, 5000 tons, the Pennsylvania Northwest Region, 2500 tons, and the Grand Trunk Western 1000 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	$32.00 to $32.50
Relaying rails	57.50 to 62.50
Car wheels	33.00 to 33.50
Steel rails, rerolling	28.00 to 29.00
Steel rails, less than 3 ft.	22.00 to 22.50
Heavy melting steel	19.50 to 20.00
Frogs, switches and guards, cut apart	19.50 to 20.00
Shoveling steel	18.50 to 19.00
Low phos. heavy melting steel	24.50 to 25.00
Drop forge flashings	17.00 to 17.50

Per Net Ton

Iron angles and splice bars	$30.00 to $30.50
Steel angle bars	18.00 to 18.50
Iron arch bars and transoms	31.50 to 32.00
Iron car axles	38.50 to 39.00
Steel car axles	30.00 to 30.50
No. 1 busheling	17.50 to 18.00
No. 2 busheling	10.00 to 11.00
Cut forge	18.00 to 18.50
Pipes and flues	13.50 to 14.00
No. 1 railroad wrought	18.50 to 19.00
No. 2 railroad wrought	18.00 to 18.50
Steel knuckles and couplers	21.00 to 21.50
Coil springs	22.00 to 22.50
No. 1 cast	26.00 to 27.00
Boiler punchings	20.00 to 21.00
Locomotive tires, smooth	17.00 to 17.50
Machine shop turnings	8.00 to 8.50
Cast borings	10.50 to 11.00
Stove plate	23.00 to 23.50
Grate bars	22.00 to 22.50
Brake shoes	20.00 to 20.50
Railroad malleable	22.00 to 22.50
Agricultural malleable	22.00 to 22.50
Country mixed	13.00 to 14.00

San Francisco

SAN FRANCISCO, Oct. 25.

Pig Iron.—The market is becoming weaker daily, with large stocks on hand. Prices are the same. In coke there is a very strong market, with a steady demand. Prices are unchanged.

Bars.—A quiet market prevails for bars, plates, rails and shapes, but inquiries are coming in for a normal tonnage. Some shipments from the East are slow in arriving and a continued car shortage is blamed. There has been no change in local quotations, and none is contemplated. The poor demand is attributed largely to a feeling that price readjustments are coming.

Structural Steel.—Dull conditions continue. Dyer Bros. have the contract for 1000 tons of steel for construction of the new Orpheum Theater, Taylor and Market streets, San Francisco.

Pipe.—The large concerns are finding it increasingly difficult to get deliveries from the East and many say the car shortage is worse than it ever was. A big demand is felt for irrigation casing, oil casing and boiler tubing. Dullness prevails throughout the entire coast in cast iron pipe. Prices are the same. The city of Los Banos is scheduled to receive bids Oct. 27 for construction of a water system.

Scrap.—The price of heavy melting scrap has been reduced to $25 a gross ton delivered at all California mills.

British Iron and Steel Market

Resumption of Work Expected Next Week—German Tin Plate for Orient

(*By Cable*)

LONDON, ENGLAND, Nov. 1.

A feeling of confidence exists as to the result of the miners' balloting which is now proceeding, though South Wales and Lancashire are hostile. Hopes are entertained that work will be resumed next week.

Meanwhile, business is still stagnant. Only 15 Cleveland blast furnaces are now operating out of 71. Prices are unchanged. There is a visible weakening in semi-finished steel, mainly owing to cheap Continental offerings.

Clyde shipbuilding output for September was 27,586 tons, the lowest month of the year, with the exception of March.

Sheet bars are officially quoted at £21, but sales have been done down to £19. Tin plate makers are not anxious to force sales, anticipating the fixing of a minimum price. A large inquiry for oil plates is before the market. German tin plates have sold for the Far East at 38s., f.o.b. Hamburg, delivery out of stock. Galvanized sheets are dull.

We quote per gross ton except when otherwise stated, f.o.b. maker's works, with American equivalent figured at $3.44 for £1, as follows:

Ship plates	£26	0	to	£33	0	$89.44	to	$113.52
Boiler plates	30	0	to	35	0	103.20	to	120.40
Tees	26	10	to	31	0	91.16	to	106.64
Channels	25	15	to	30	5	88.58	to	104.06
Beams	25	10	to	30	0	87.72	to	103.20
Round bars, ¾ to 3 in.	28	0	to	33	0	96.32	to	113.52
Rails, 60 lb. and up	25	0	to	27	0	86.00	to	92.88
Billets	18	0	to	20	0	61.92	to	68.80
Sheet and tin plate bars								
Welsh	19	0	to	21	0	65.36	to	72.24
Galvanized sheets, 24 g.	37	0	to	38	0	127.28	to	130.72
Black sheets, 24 g. to 26 g.	50	0	to	54	0	172.00	to	185.76
Tin plate base box	2	2½				7.31		
Steel hoops	38	15	to	39	0	133.30	to	134.16
Cleveland basic iron	11	15				40.42		
West Coast hematite	15	15				54.18		
Cleveland No. 3 foundry	11	5				38.70		
Ferromanganese	35	0	to	40	0	120.40	to	137.60
Coke	3	2¾				10.79		

Agitation to Prohibit Imports Follows the Stagnation of Industry by Coal Strike

LONDON, ENGLAND, Oct. 18.—The blow has fallen, and with over a million miners out on strike and coal production at a standstill, iron and steel works all over the country are already idle. The full extent of the stoppage is not definitely discernible yet, but from all districts reports come to hand that works have closed. In Cleveland there was an immediate shutting down. Palmers' works, including blast furnaces, steel plant and rolling mills, shut down at once, and the men in their shipyards are on one day's notice. Most of the other Tyneside industries adopted the same course, and by the end of the week practically a complete stoppage is probable.

On the Wear and Tees a similar condition of affairs prevails, and even at Darlington most of the works closed on Saturday. The Barrow steel plant has shut except the foundries and the hoop mills. The South Durham plate mills at Stockton on Tees and Whitwells works at Thornaby are closed. In Wales most steel plants are already idle, and there will be a general stoppage of the tin plate and galvanized sheet industries by the end of the week. All the rolling mills at Wigan are closing, and the bulk of the Scotch iron and steel works and furnaces are also shutting down completely.

At the end of the week it is expected that a quarter of a million men will be idle in South Wales alone. This gives some indication of the position of industry in this country, and he would be foolish indeed who did not recognize the probability of serious developments.

The capitalist interests are determined that if possible they will exclude all foreign steel from the country. The agitation is being worked up by the usual newspaper propaganda, and an anti-dumping bill is to be tabled in the House of Commons during the next session, the discussion of which will no doubt provide harrowing examples of the way in which British steel makers have been undercut by America, Belgium and Germany. Nothing will be heard of the prices demanded by British manufacturers, of their refusal to make firm quotations, or of their too frequently delivering high priced contracts and refusing to give deliveries of lower priced contracts booked months before, and the feeling of the electorate will be duly worked upon from this point of view. Whether there is sufficient sanity left in this country to see the abyss to which the path at present being pursued leads is quite an open matter, but all vested interests will beat the patriotic drum and howl for the exclusion of imported material. This is absolutely certain. Whether they prevail depends upon undeterminable factors.

With the cessation of industry, buying also has ceased, and all markets are in a state of stagnation awaiting results.

GOGEBIC MINES IN MICHIGAN

Proposed Change in Boundary Would Leave Only the Montreal in Wisconsin

MARQUETTE, MICH., Oct. 30.—The State of Michigan is taking steps to bring before the Supreme Court of the United States the question of the west and south boundaries of the upper peninsula, with the idea of securing control of that portion of the Gogebic range that lies between the east and west branches of the Montreal River. The east branch is now the boundary. Also there is the hope of adding to Michigan some 600 square miles of forest and farming land lying to the south of the present southern boundary, from the west corner of the State to the head of the Menominee River.

If Michigan officials are successful in their contention, all iron mines on the Gogebic range east of and except only the Montreal, will be Michigan territory. The distance along the range from the present accepted boundary at the east branch of the river to the west branch is three miles, and the mines affected are Germania, Ottawa, Windsor, Cary and West Cary, and Superior. Of these only Cary, under control of Pickands, Mather & Co., and Ottawa (Oglebay, Norton & Co.) are operating.

The constitution of Michigan provided that the west line of the upper peninsula of the State should follow southerly from Lake Superior along the main branch of the Montreal River to its source; that the south boundary should follow a direct course south of east from the source of the Montreal to the headwaters of the Menominee River, and thence down that river to Green Bay. It is contended that the main branch of the Montreal is its west branch and not its east, and the flows of the two substantiate this. The head of the west branch is Island Lake, in sections 19, 30 and 31, township 44, range 2 east, some ten miles southwest of the point where the boundary now turns easterly to the Menominee. From this turning point, which is not the head of the east branch but some miles north of it, the boundary runs direct, not to the Menominee, but to Lac Vieux Desert, and thence offsets to the river.

Michigan authorities are confident that their position is correct according to the originally intended boundaries, but the fact that never until now has any definite move been instituted to claim this territory may militate against its enforcement at this late day. Iron miners in the two States affected will be much interested in the outcome.

Iron and Industrial Stocks

The net change in iron, steel and industrial stocks for the week ended Oct. 30, averaged a drop of 1½ points. The greatest change downward was that of the Crucible Steel Co. of America, which was lowered 5 points from the week before. An exception to the general trend was the Virginia Iron, Coal & Coke Co., which registered a 4-point gain. United States common dropped a quarter of a point.

The traditional pre-election rise of the market proved a myth this year and caused some disappointment in market circles. United States Steel advanced early in the week on the strength of the rumor that the directors would issue a 10 per cent extra dividend in common stock or Liberty Bonds to partly offset the shrinkage in market value of shares purchased by employees on the profit-sharing plan. The purchase price last year was 106. When this dividend was not declared, the stock was depressed, but rebounded on the strength of the quarterly financial report, which showed net for the common equal to $4.76 per share. These earnings were satisfactory in view of the increased freight which the Steel Corporation subsidiaries paid for raw materials.

About the middle of the week, industrials declined, partly because of high money rates and partly because of disturbing news in regard to the British coal strike. A rise set in toward the week's close.

The range of prices on active iron and industrial stocks from Saturday of last week to Monday of this week was as follows:

Allis-Chalm. com.	32 - 33¾	Midvale Steel....	37½ - 38½
Allis-Chalm. pf..	75 - 76	Nat-Acme	33⅛ - 34
Am. Can com...	32⅜ - 34¼	Nat. E. & S. com.	57 - 59½
Am. can pf.....	87 - 87⅝	N. Y. Air Brake.	94¾ - 97
Am. C. & F. com.	132½ - 135½	Nova Scotia Stl.	40 - 41
Am. C. & F. pf.. ..	-110	Pressed Stl. com.	95½ - 98
Am. Loco. com.	94½ - 97	Pressed Stl. pf... ..	-100
Am. Loco. pf.... ..	-100⅛	Ry. Stl. Spg. com.	94½ - 95
Am. Stl. F. com.	36¾ - 38	Ry. Stl. Spg. pf. ..	-106
Am. Stl. F. pf...	- 87⅞	Replogle Steel...	78 - 81
Bald. Loco. com.	110¼ - 115⅞	Republic com....	74⅛ - 79½
Bald. Loco. pf... ..	- 98½	Republic, pf..... ..	94
Beth. Steel com..	66½ - 67¾	Sloss com.....	62¾ - 67
Beth. Stl., Cl. B.	67¾ - 71⅞	Sloss, pf..... ..	- 83½
Beth. Stl., 8% pf.	104¾ - 104⅞	Superior Steel...	47½ - 49
Case, J. I. pf.... ..	- 85	Transue-Will	- 45
Chi. Pneu. Tool.	76 - 78½	U. S. Alloy Steel.	37½ - 37⅞
Cruc. Steel com.	121 - 130¾	U. S. Pipe com. ..	- 14½
Cruc. Steel pf...	90 - 93	U. S. Pipe pf....	41½ - 42
Gen. Electric....	137½ - 139½	U. S. Steel, com.	86½ - 89⅞
Gt. No. Ore cert.	33¼ - 34½	U. S. Steel pf...	107 - 108⅛
Gulf States Stl.	40 - 49	Vanadium Steel.	61¾ - 65⅜
Int. Har. com...	103¼ - 108½	Va. I. C. & Coke.	113½ - 115
Int. Har. pf.....	107 - 109	Westingh. Elec..	46 - 47
Lackawanna Stl.	63 - 66½		
Lake Sup. Corp..	10⅞ - 11½		

Dividends

Pressed Steel Car Co. regular quarterly of $2 on the common stock, payable Dec. 8 to stockholders of record Nov. 17, and of $1.75 on preferred, payable Nov. 30, to stockholders of record Nov. 9.

Pittsburgh Steel Co. regular quarterly of $1.75 on preferred stock, payable Dec. 1, to stockholders of record Nov. 15.

Standard Sanitary Mfg. Co. regular quarterly of 1¾ per cent on preferred stock and 1½ per cent and 1 per cent extra on the common stock, all payable Nov. 10, to stockholders of record Nov. 4.

Industrial Finances

A banking syndicate is offering at 99½ and accrued interest, to yield more than 8 per cent, a new issue of $5,500,000 of Lukens Steel Co. first mortgage 20 year 8 per cent gold bonds due on Nov. 1, 1940.

Purchase of the bonds up to 107½ and accrued interest will be provided for in a sinking fund of not less than 25 per cent of net earnings after depreciation, taxes and interest. That fund is to be not less than $100,000 in any year. After Nov. 1, 1925, the bonds are callable at 107½ and accrued interest to exhaust the sinking fund.

The issue is a direct first mortgage on the company's fixed assets now owned or that may be acquired. Net tangible assets offsetting this issue, after giving effect to this financing, based on the balance sheet of Aug. 31, will be $19,026,249, of which $6,674,729 will be net quick assets. For the ten years to Oct. 31, 1919, average annual net profits, after depreciation but before Federal taxes and interest on floating debt, have been $2,311,217. The annual interest charges on the present issue amount to $440,000.

Surplus of the Wickwire Spencer Steel Corporation for the nine months ended Sept. 30 showed $13,728,110, equivalent, after allowing for dividends on preferred and class A common stock, to $4.15 a share on 250,000 shares of common stock at no par. Net sales totaled $26,011,843, while the balance amounted to $3,560,691 for the period. Surplus, after charges and Federal taxes for the quarter ended Sept. 30 disclosed $573,376. Net sales for the period totaled $9,046,161, while the balance showed $1,184,236.

The Wheeling Machine Products Co., manufacturer of screw machine products, Wheeling, W. Va., has been authorized to increase its capital from $50,000 to $100,000, for the purpose of a general expansion of the business in the manufacture of automatic screw machine and turret lathe products. E. W. Krause is treasurer and general manager of the company, which is the first of its kind in West Virginia.

OFFICE CHANGES

The Cement Gun Co., Inc., has moved its main office from Allentown, Pa., to Cornwells, Bucks Co., Pa., a suburb of Philadelphia, where its vice-president and general manager, B. C. Collier, will connect himself in an executive capacity in the distribution of the trucks and farm tractors, manufactured by the Traylor Eng. & Mfg. Co.

The Latrobe Electric Steel Co. has moved its Cleveland sales office from the Union Bldg. to 1280 Ontario St., where it has opened a warehouse in which it will carry a complete line of its high-speed and carbon tool and other steels.

S. Birkenstein & Sons, Inc., dealers in old metals, 377-409 West Ontario Street, Chicago, are about to move to a new reinforced concrete building with 175,000 sq. ft. of floor space, which has been erected at North Avenue and the Chicago, Milwaukee & St. Paul Railroad at a cost of $500,000.

The Ilg Electric Ventilating Co., Chicago, maker of ventilating apparatus and unit heaters, is moving into its new building at 2850 Crawford Avenue, that city. The building is of concrete construction, 300 x 200 ft., two stories, a total floor space of 100,000 sq. ft., built at a cost of $400,000. Employees of the Ilg company share in profits. A large percentage of the workpeople are also stock holders. S. W. Weis is president, J. M. Frank, vice-president and general sales manager and Robert A. Ilg, treasurer and general manager.

The Pittsburgh district sales office of the Columbia Steel & Shafting Co., formerly in the Empire Building, now is located in the Park Building.

The New York office of the National Engineering Co., manufacturer of the Simpson sand mixer for foundry purposes, has moved from 15 East 40th Street to 248 Fulton Street, in charge of its Eastern sales manager, S. H. Cleland.

The S. Obermayer Co., manufacturer of foundry equipment, has opened an office and warehouse at Blanchard and Ferry streets, Newark, N. J., to take care of export business and serve foundrymen of the East. H. E. Beckman, formerly of Chicago, is in charge.

The address of the new Pittsburgh office of the National Tool Company, Cleveland, is 988 Union Arcade Building. It is in charge of R. T. Brown and J. A. Powell, both well known in the Pittsburgh district.

The Detroit branch office of the Wetmore Reamer Co. of Milwaukee has formed a new company to handle the sale of Wetmore expanding reamers in Michigan, exclusive of the northern peninsula. James J. Ward has resigned as assistant sales manager of the Wetmore company to become one of the three members of the new firm known as the Wayman-Taylor-Ward Co. Messrs. Wayman and Taylor previously handled this work, being responsible for the extensive use of Wetmore reamers in such plants as Ford, Paige, Dort, Lincoln, etc. The location of the offices has been changed to 403 Real Estate Exchange Building, Detroit.

German Fuel Scarce, Steel Profits Large

Stinnes and Other Consolidations Absorb More Works — Dutch Capital Acquires Further Foothold—Falling Demand for Steel

(*Special Correspondence*)

BERLIN, GERMANY, Oct. 11.—The German iron trade is feeling more and more acutely the effects of the heavy deliveries of coal to France, Belgium and Italy, in accordance with the Spa agreement. They amounted in September to about 882,000 tons, exclusive of shipments from Upper Silesia to Italy. It appears from the reports that France is accepting only the highest grade coal, leaving German consumers to get along with the inferior qualities. These coal deliveries are having an exceedingly upsetting effect in the iron trade. A number of blast furnaces and mills have already reduced or ceased production. In the Rhenish-Westphalian district 21 blast furnaces have already been blown out. Two open-hearth steel plants have entirely stopped production, and 9 furnaces at other plants have been shut down.

This occurs at a time when there is a very active demand for pig. The demand is greater than production; and imports of pig from Lorraine and Luxemburg—made with German coke, which German furnaces are unable to obtain—are increasing rapidly. The shrinkage in the production of steel is reported as having already reached 12 to 15 per cent. Important iron working establishments at Bremen, Hamburg, Cassel, Hanover, and other towns, which were getting over 82 per cent of their coal requirements in May, are now getting less than 48 per cent, while copper smelters are getting only 46, and the iron mines of the Siegerland region have lost about one-third of their coal.

American Coal for German Steel Works

Coal production in September in the Rhenish-Westphalian region scored a further increase, having reached 27,590,000 tons, as against 27,290,000 tons in August. In view of the shortage of coal several of the biggest establishments on the lower Rhine have begun to import American coal at a laid-down cost of about 2,000 marks per ton. The Gutehoffnungshütte and the August Thyssen-Hütte — as the old Gewerkschaft Deutscher Kaiser is now called—are among these importers. Krupp is changing and adapting some furnaces for the consumption of brown coal, and is reported to have contracted for deliveries of 15,000 tons per month. Other establishments are doing likewise.

Owing to the blowing out of many furnaces, as already mentioned, there is a marked scarcity of pig iron, and conversely ore supplies have accumulated. The market, in fact, is rather glutted with ores. There are large offers from overseas, and minettes from Lorraine and Luxemburg are again obtainable, France having withdrawn the embargo against exports at the middle of September after six weeks of regular arrivals of the stipulated amounts of German coal and coke. To meet this situation the Siegerland Ore Syndicate has just cut prices 5 marks the ton for roasted and 3.40 for crude sparry iron ore, which makes the present prices 411.50 and 274.50 marks respectively.

Demand Less and Prices Decline

In finished and half-finished products trade is rather inactive, and buyers still show a strong inclination to hold off. There is a strong feeling that prices will again have to be scaled down at the end of this month. [A cablegram of Oct. 25, printed in THE IRON AGE of Oct. 28, told of a reduction of about 14 per cent decided on by the Iron Industry Union.—EDITOR.] Orders for rolling mill products are being reduced, and foreign sales are growing more difficult. In view of this latter fact the price of bars for export to Holland was reduced last week from 235 to 200 gulden. The cut, it was explained, was occasioned by the fact that German works were no longer able to get foreign orders at the higher price, especially in the face of Belgian, Luxemburg, Lorraine and Saar competition. Even German export agents in Holland, it is said, have latterly taken to buying Belgian bars. Not only did prices favor this preference, but buying in Germany was considerably hindered through the cumbersome system of export licenses which for months has been complained of in the trade as a most serious obstacle to Germany's export trade.

Russia Buying in Germany

There have been many inquiries recently from foreign sources, but few transactions have been effected. Under these circumstances price cutting in bars is frequent, going apparently beyond the official cut already mentioned. A novelty in the trade is a Russian order of several million marks for saws, being apparently the first order from Russia since the war. This order will give profitable employment to Remscheid shops for some months, whereas the tool trade is otherwise very quiet. Further large Russian orders for tools are in prospect and will be placed as soon as arrangements for financing and shipping can be made. The organization of an export pool in steel rails is under discussion and is expected to be realized soon.

Stinnes Gathering in More Steel Companies

Fights for control of various companies have already been mentioned in this correspondence. The chief operation of this kind during recent weeks has been heavy buying of the shares of the Bochumer Gusstahl-Verein on the Berlin Exchange. It turns out that the buyer was Hugo Stinnes, who is developing more and more into the one great iron magnate of Germany. He made huge sums of money on war contracts, and his company (Deutsch-Luxemburg) and its new ally, Gelsenkirchen, have both come into possession of large sums through compulsory sales of properties in Lorraine and Luxemburg. This new combination, which has taken the name of Rhein-Elbe-Union, is now swallowing up the Bochum concern, which, though not itself one of the largest, is one of the most efficient and best-paying of German iron companies. Its capital is now 70,000,000 marks.

Dutch Capital in German Steel

Meanwhile the plan of Dutch capitalists to acquire a controlling position in the Phoenix company, about which I wrote in these columns some months ago, has made a big step toward completion. Those interests have now secured 40,000,000 or more of the entire capital stock of 105,000,000 marks, and six of their representatives are to be elected to the board of the company at an early date, all residents of Amsterdam. It is the same group of capitalists who for some months have been planning the erection of a blast furnace and steel plant in Holland and have been seeking connection with some big German steel works in order to take advantage of its experience. It is now understood that they have abandoned for the time their plan to build a steel plant owing to the extraordinary expense. Instead, they will erect a blast furnace plant and exchange with Phoenix their pig for steel. They hope in this way fully to supply the Dutch market with steel.

Another Dutch operation brings upon the scene a probable rival to the above concern. The Dutch firm William Mueller & Co. has acquired a majority of the stock of the Kraftwerke. This is a blast furnace plant in the vicinity of Stettin. Several years before the war it secured control over the Niederrheinische Hütte in the Essen district, which embraces blast furnaces and steel plant.

The Stumm Brothers Company continues its annex-

ation of other establishments in the Essen district. It has just taken over the firm of Brenne, Hangarter & Co. in Haspe, a concern that manufactures railroad supplies. The Stumm interests are to be consolidated into a joint stock company, with headquarters at Duesseldorf. Various other amalgamations are under discussion, too numerous for mention here.

Enormous Profits in Steel

Iron companies continue to publish the most astonishing annual reports that Germany has ever seen. They have been earning so much money that they have manifest difficulty in drawing up their balance sheets. Hence they are making unusually heavy write-offs for depreciation or for reserves and devoting unusual sums to building up insurance or aid funds for employees.

Phoenix, mentioned above, is a striking illustration. Its report shows gross profits of 68,943,000 marks. It writes off 21,250,000 marks for depreciation, devotes another 10,000,000 marks to new construction, and sets aside 5,000,000 for workmen's pensions. A dividend of 20 per cent is declared, compared with 8 per cent last year, which latter was accomplished only by drawing heavily upon the surplus. A year ago the company seemed in a most precarious position, with a debt for Swedish ores amounting to 23,500,000 crowns, which, at the present rate of exchange, would amount to over 300,000,000 marks. Yet it reduced this debt by four-fifths, leaving only 5,900,000 crowns to be paid.

The Laura-Hütte, one of the great Silesian companies with a capital of 54,000,000 marks, had gross profits of 60,000,000 marks, comparing with a loss last year of 6,491,000 marks. The net loss last year, after writing off depreciation, was 10,824,000 marks. It now carries 10,800,000 marks to the reserves, devotes 32,320,000 marks to the various interests of its employees, and distributes a dividend of 20 per cent, compared with nothing last year. The company's gross profits make its previous record year, 1916, when nearly 17,000,000 was earned, look exceeding small.

The van den Zypen Stahlwerke had gross profits of 20,622,000 marks, against 6,436,000 last year, and the dividend is 30 per cent against 10. Thyssen & Co. (Gewerkschaft Deutscher Kaiser), with a capital of 15,000,000 marks, had gross profits of 10,955,000.

The Swiss government, which has been exploring for iron ore deposits for several years, has discovered one of some 1,500 acres in the Frick Valley. Some 15,000,000 tons have been estimated, with less than half of the deposit explored. A furnace plant is to be established, with the state as part owner. Electrical smelting will be employed, with a saving of nearly three-fourths of the coke burnt in ordinary furnaces.

Entente Crippling Germany

The report, to-day officially confirmed, that the entente governments have decided to destroy all the high-speed Diesel motors in German shops and other manufacturing concerns and to prohibit further construction of them has thrown financial and industrial circles into a state of great excitement. The strong tendency exists here to regard this as a deliberate plan to wreck Germany's economic position in the world. In view of the fact that Germany is overrun with entente commissions, which carry on minute inspections into all phases of production bearing upon possible war preparations, the pretext that these motors might possibly be used in equipping submarines is held to be absurd. How Germany could build and equip submarines without being discovered remains to be explained.

REFUSED TO REPORT

Attitude of Coal Operators Results in Suspension of Government Statement

WASHINGTON, Nov. 1.—After failing to obtain the voluntary co-operation of a sufficient number of coal operators, the Federal Trade Commission has suspended collection and publication of the monthly figures on costs of producing bituminous coal. The commission makes public the cost reports for June covering 555 operators, which show an increase in the "margin" between sales realization and f.o.b. mine cost per ton to 74c. from 51c. per ton in May. This "margin" is not the same as profit, inasmuch as to arrive at the amount available for income and excess profits taxes, dividends, or surplus, there must be deducted such items as selling expenses and interest on borrowed capital, while there must be added certain items such as income from outside investments.

When the commission resumed publication of monthly coal costs figures last January about 1500 operators responded to the questionnaire. Many of these stopped reporting after the Supreme Court of the District of Columbia in the Maynard Coal Co. case decided that the commission was exceeding its authority. The total dwindled to about 1000 in the spring, and now with the total down to 555 the commission holds that until the legal question involved is decided by the Supreme Court of the United States, it is futile to continue the gathering of the cost statistics. The Maynard Coal Co. case is still pending appeal from the District of Columbia Supreme Court. The case involving the right of the commission to require cost reports from steel producers is pending before the same court, no action having been taken since the issuance of the temporary restraining order last spring.

In announcing the suspension of further cost reports the commission states that it believes the ascertainment of facts relating to the cost of production in such a fundamental industry as that of bituminous coal production to be of the greatest usefulness to the industry as well as valuable to the public. Believing that under the present situation the reports would become misleading because a sufficient number of coal producers were not represented, the commission states that it is better to discontinue the work pending the judicial decision of the matter.

The 555 operators represented in the June report produced only about 18 per cent of the bituminous coal of the country. Their average sales realization for June was $3.44 per ton, while their reported total f.o.b. mine cost amounted to $2.70. Of this latter amount, $2.02 represented labor cost per ton, 31c. the cost of supplies, and 37c. general expenses. The sales realization of 535 identical operators for whom comparison is made between the months of May and June increased from $3.23 per ton in May to $3.43 per ton in June, while their total reported f.o.b. mine cost decreased from $2.72 per ton to $2.69 per ton, and their resultant margin increased from 51c. per ton in May to 74c. in June.

Manufacturer's Sales Co. Organized

The Manufacturer's Sales Co. has been organized, with offices in the Leader-News Building, Cleveland, to represent in Cleveland and surrounding territory one or possibly two large reliable manufacturers for the sale of their products. C. C. Bradford, for a number of years sales manager of the U. S. Light & Heat Corporation, and more recently sales manager of the Marlin Rockwell Corporation, has been selected to manage the affairs of this new enterprise. Mr. Bradford is widely acquainted among manufacturers and buyers throughout the Middle West and has had extensive experience in developing large and successful sales organizations.

The plans and policies of the Manufacturer's Sales Co. are said to be most attractive to manufacturers of mechanical or electrical products who may now have district sales offices in Cleveland or may be desirous of opening up new business in that section.

Plans for a half million dollar hospital for the Illinois Steel Co., South Chicago, which have been held up for a number of years, are again under preparation by Schmidt, Garden & Martin, architects, Chicago.

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin	Lead		Zinc	
October	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
27	15.12½	15.12½	40.75	6.90	6.65	7.45	7.00
28	15.12½	15.12½	40.50	6.90	6.65	7.40	6.95
29	15.00	15.00	40.50	6.90	6.65	7.35	6.90
30	15.00	15.00	.....	6.90	6.65	7.35	6.90
November							
1	15.00	15.00	39.50	6.90	6.65	7.35	6.90

NEW YORK, Nov. 1.

All the markets except tin are weaker and buying demand is practically at a standstill. The price of copper has again declined but buying is slightly improved. The practical ending of the British coal strike has rendered the tin market a little stronger, but buying is still light. The lead and zinc markets are both exceedingly quiet and a little weaker. Antimony has declined.

New York

Copper.—Practically all of the producers of copper, large and small, are quoting electrolytic at 15c., New York, for delivery in the next two months and at 15.25c., New York, for delivery in January and February. Lake copper is on the same basis. There are rumors that buyers realize the metal is cheap at 15c. and that some substantial purchases have been made, but while demand has improved slightly there is no confirmation of any heavy purchasing yet. Consumption is decreasing, which is a factor in the copper as in all the other markets. It is pointed out, however, that in the long run foreign buying must inevitably be a factor sooner or later.

Copper Averages.—The average price for both Lake and electrolytic copper for the month of October, based on daily quotations in THE IRON AGE, was 16.56c., New York.

Tin.—The market is stagnant and inactive and despite the advance of the metal in London buyers generally continue to hold off. Because of the settlement of the British coal strike, quotations for spot Straits tin in this market have advanced slightly, but there continue to be few buyers and too many sellers, resulting in a more or less deadlocked position. It is believed that consumers are using invisible supplies and it is understood that one large seller has taken most of the availaole orders in the last few months. There have been further sales on the New York Metal Exchange of various lots of tin under the rule, the total amounting in the last week to about 150 tons, some for spot shipment and others for future at prices ranging from 39.30c. to 41.25c. The London market is again higher than a week ago, the quotation there to-day for spot standard having been £266; for future standard, £267, and for spot Straits, £270, the latter being £10 per ton higher than a week ago. The New York quotation for spot Straits to-day is 39.50c. per lb. Deliveries into consumption for the month of October have been 3415 tons, of which 3100 tons came in through Atlantic ports. Tin in stocks and landing on Oct. 31 was 3191 tons. The quantity afloat on Oct. 29 was 4150 tons.

Lead.—There is very little animation to the market, which continues without feature. Spot and shipment lead or lead in transit have been offered and sold at 6.90c., New York, and there have been liberal offerings at 6.65c., St. Louis, which we quote as the outside market. The leading interest still maintains its quotation at 7c., St. Louis, and 7.25c., New York. The domestic market has now reached a level considerably below the cost of importation, which is well above 7.50c., seaboard, and therefore little is to be feared from this source in the immediate future.

Zinc.—There continues to be no activity in this market, and as a result of the light offerings values have again eased off slightly. Domestic prime Western is quoted at 6.90c., St. Louis, or 7.40c., New York, but as some export metal reshipped to this country is still available the New York market is quoted at 7.35c. on this basis. The imported metal continues to be less and less of a factor. Consumptive demand is limited to immediate needs, but there are indications that there is a stiffening in the quotations for future deliveries.

Antimony.—Wholesale lots for early delivery are quoted at 6.37½c., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is still quoted by the leading interest at 32.90c., f.o.b. producer's plant, while the same grade from other sellers is obtainable at 28c. to 29c. per lb., New York.

Chicago

Nov. 1.—The metals are exceedingly quiet and copper, lead and spelter have declined. The old metals remain unchanged in price. We quote Lake copper at 16c. in carload lots; tin, 42c.; lead, 6.75c.; spelter, 7c.; antimony, 8.50c. to 9c. On old metal we quote copper wires, crucible shapes, 10.50c.; copper clips, 10.50c.; copper bottoms, 9.50c.; red brass, 10.50c.; yellow brass, 7.50c.; lead pipe, 5.25c.; zinc, 4c.; pewter, No. 1, 20c.; tinfoil, 27.50c.; block tin, 30c.; all these being buying prices for less than carload lots.

St. Louis

Nov. 1.—The non-ferrous markets were dull and lower, closing the week in car lots as follows: Lead, 6.60c.; spelter, 6.90c.. In less than car lots the quotations were: Lead, 7.50c; spelter, 7.75c.; tin, 46c.; copper, 18c.; antimony, 9c. The white metals generally showed a weakening tendency, but the casting metals were rather in better demand and somewhat stronger than the white. In the Joplin district the ore market showed depression and the output continued to be still further reduced because of the unwillingness of the mine owners to accept the prices made of $65 for lead, basis 80 per cent; $40 for zinc blende, basis 60 per cent, and calamine $32 per ton, basis 40 per cent. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 6c.; heavy yellow brass, 8c.; heavy red brass, 11c.; heavy copper and copper wire, 11.50c.; light copper, 10c.; pewter, 24c.; tinfoil, 30c.; zinc, 4c.; lead, 5.50c.; tea lead, 3c.; aluminum, 15c.

Puddlers' Strike Ended

A settlement of the strike of the puddlers at the plant of the Cohoes Rolling Mill Co., Cohoes, N. Y., has been effected according to advices received at the offices of the Amalgamated Association of Iron, Steel and Tin Workers in Pittsburgh. Union puddlers have been out on strike for several weeks in almost all of the Eastern bar iron and muck bar plants on account of the refusal of Eastern manufacturers to meet the advance of 15 per cent granted by the Western Bar Iron Association at the annual conference in Atlantic City last June between representatives of that organization and the Amalgamated Association. The increase was equivalent to $1.14 per ton on the 1.50c. card and resulted in increasing the differential between the scales of the mills working under the Eastern jurisdiction and those embraced in the Western section to $2.76 per ton, as against $1.62 the former differential. Eastern puddlers demanded the restoration of the $1.62 differential, and this demand being refused, they went out on strike. It is said by Amalgamated officials that the Cohoes Rolling Mill Co. has agreed to go back to the old basis and to be governed in its scales by the bimonthly examination of sales books. Since the present Western puddling rate is $18.02 per ton, that to be paid by the Cohoes company will be $1.62 per ton less or $16.40 per ton. The Burden Iron Co., although not working under an agreement with the Amalgamated association, is reported to be basing its wages on the Amalgamated scale and paying puddlers 10c per ton more, or $16.50 per ton.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight Rates

Freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia	$0.35	St. Paul	0.695
New York	0.38	Omaha	0.815
Boston	0.415	Omaha (pipe)	0.78
Buffalo	0.295	Denver	1.35
Cleveland	0.24	Denver (wire products)	1.415
Cincinnati	0.33	Pacific Coast	1.665
Indianapolis	0.345	Pacific Coast, ship plates	1.335
Chicago	0.38	Birmingham	0.765
St. Louis	0.475	Jacksonville, all rail	0.555
Kansas City	0.815	Jacksonville, rail and water	0.46
Kansas City (pipe)	0.78	New Orleans	0.515

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver, the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural sizes, 2.45c. to 3.10c.

Wire Products

Wire nails, $3.25 to $4.50 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.50 to $2 and shorter than 1 in., $2 to $2.50. Bright basic wire, $3.25 to $4 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25 as quoted by the American Steel & Wire Co., and No. 8 and heavier, $4 to $4.25, the range of independent makers; galvanized wire, $3.95 to $4.70; galvanized barbed wire and fence staples, $4.10 to $5.20; painted barbed wire, $3.40 to $4.60; polished fence staples, $3.40 to $4.50; cement-coated nails, per count keg, $2.85 to $4.10; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days, net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 55 to 58 per cent off list for carload lots, 54 to 57 per cent for 1000-rod lots, and 53 to 56 per cent for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$4.75 to $5.00 base
Large boiler rivets ..... 4.85 to 5.00 base
Small rivets .....45 to 40 per cent off list
Small machine bolts, rolled threads
40 and 5 to 25 and 10 per cent off list
Same sizes in cut threads.....30 and 10 to 25 per cent off list
Longer and larger sizes of machine bolts
30 to 25 per cent off list
Carriage bolts, ¾-in. x 6-in.:
Smaller and shorter, rolled threads
30 and 10 to 20 per cent off list
Cut threads .....30 to 20 per cent off list
Longer and larger sizes.....25 to 20 per cent off list
Lag bolts .....45 to 40 per cent off list
Plow bolts Nos. 1, 2 and 3 head.....35 per cent off list
Other style heads .....20 per cent extra
Machine bolts, c.p.c. and t. nuts ¾-in. x 4-in.:
Smaller and shorter.....30 to 10 per cent off list
Longer and larger sizes.....20 to 10 per cent off list
Hot pressed sq. or hex. blank nuts.....$1.50 to 50c. off list
Tapped nuts .....$1.00 off list
C. p. c. & t. sq. or hex. nuts, blank.....list plus $1.00
C. p. c. & t. sq. or hex. nuts, tapped.....list plus $1.00
Semi-finished hex. nuts, U. S. S. and S. A. E.:
⅝-in. and larger.....50 and 10 to 40 per cent off list
9/16-in. and smaller.....50 and 10 to 40 per cent off list
Stove bolts in packages.....60 and 10 per cent off list
Stove bolts in bulk.....60, 10 and 2½ per cent off list
Tire bolts .....50 per cent off list
Track bolts .....7c. base
Iron cap screws .....40 per cent off list
Set screws .....40 and 10 per cent off list
One cent per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs 25c. extra.
All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $57 to $75; chain rods, $57 to $75; screw stock rods, $62 to $80; rivet and bolt rods and other rods of that character, $57 to $75; high carbon rods, $80 to $100, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16-in. and larger, $4 to $4.25 per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ½-in., ⅝-in. and 7/16-in., $4.40 to $5; 5/16-in., $5 to $5.75; track bolts, $7. Boat and barge spikes, $4.40 to $5 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Tie plates, $3 to $4 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., $13.80 per package; 8-lb. coating, I. C., $14.10; 12-lb. coating, I. C., $15.80; 15-lb. coating, I. C., $16.80; 20-lb. coating, I. C., $18.05; 25-lb. coating, I. C., $19.30; 30-lb. coating, I. C., $20.30; 35-lb. coating, I. C., $21.30; 40-lb. coating, I. C., $22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. to 3.25c. from mill. Common bar iron, 4.75c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

Butt Weld

Steel			Iron		
Inches.	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	47 to 50½	20½ to 24	⅜	15½ to 25½	+1½ to 11½
½	51 to 54½	36½ to 40	½	19½ to 29½	1½ to 11½
¾ to 3	54 to 57½	41½ to 44	¾ to 1½	24½ to 34½	8 to 18½

Lap Weld

2	47 to 50½	34½ to 38	2	20½ to 28½	6½ to 14½
2½ to 6	50 to 53½	37½ to 41	2½ to 6	22½ to 30½	9½ to 17½
7 to 12	47 to 50½	33½ to 37	7 to 12	19½ to 27½	6½ to 14½
13 and 14	37½ to 41				
15	35 to 38½				

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	43 .o 46½	25½ to 29	¼	+17	+50
½	48 to 51½	35½ to 39	⅜	13½ to 23½	6½ to+3½
¾ to 1½	52 to 55½	39½ to 43	½	18½ to 28½	5½ to 15½
2 to 3	53 to 56½	40½ to 44	¾ to 1½	24½ to 34½	9½ to 19½

Lap Weld, extra strong, plain ends

2	45 to 48½	33½ to 37	2	21½ to 29½	8½ to 16½
2½ to 4	48 to 51½	36½ to 40	2½ to 4	23½ to 31½	11½ o 19½
4½ to 6	47 to 50½	35½ to 39	4½ to 6	22½ to 30½	10½ to 18½
7 to 8	43 to 46½	29½ to 33	7 to 8	14½ to 22½	2½ to 10½
9 to 12	38 to 41½	24½ to 28	9 to 12	9½ to 17½	5½ to+2½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots and on butt and lap weld galvanized iron pipes have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
1¾ to 1⅞ in.	+ 7 to — 19½	1½ to 1¾ in.	+ 23
2 in.	+ 2 to — 19½	1¾ to 1⅞ in.	+ 20
2¼ to 2½ in.	3 to 30½	2 in.	+ 10 to 15
2¾ to 3¼ in.	11 to 30½	2¼ in.	+ 10 to 12
3½ to 4½ in.	20 to 40½	2½ in.	+ 1 to 10
		2¾ to 3¼ in.	— 1½ to + 3
		3½ to 4½ in.	—8 to list

Standard Commercial Seamless—Cold Drawn or Hot Rolled

	Per Net Ton		Per Net Ton
1 in.	$327	1¾ in.	$207
1¼ in.	267	2 to 2½ in.	177
1⅜ in.	257	2¾ and 3¾ in.	167
1½ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department which will be subject to special negotiations.

Sheets

Prices of the Steel Corporation for mill shipments on sheets of United States standard gage in carloads and larger lots for indefinite delivery are given in the left-hand column. For prompt delivery, independent mills are getting up to the prices quoted in the right-hand column:

	Cents per lb.
Blue Annealed	
No. 8 and heavier	3.45 to 5.20
Nos. 9 and 10 (base)	3.55 to 5.25
Nos. 11 and 12	3.60 to 5.30
Nos. 13 and 14	3.65 to 5.35
Nos. 15 and 16	3.75 to 5.45
Box Annealed, One Pass Cold Rolled	
Nos. 17 and 21	4.15 to 6.80
Nos. 22 to 24	4.20 to 6.85
Nos. 25 and 26	4.25 to 6.90
No. 27	4.30 to 6.95
No. 28 (base)	4.35 to 7.00
No. 29	4.45 to 7.10
No. 30	4.55 to 7.20
Galvanized Black Sheet Gage	
Nos. 10 and 11	4.70 to 7.50
Nos. 12 to 14	4.80 to 7.60
Nos. 15 and 16	4.95 to 7.75
Nos. 17 to 21	5.10 to 7.90
Nos. 22 to 24	5.25 to 8.05
Nos. 25 and 26	5.40 to 8.20
No. 27	5.55 to 8.35
No. 28 (base)	5.70 to 8.50
No. 29	5.95 to 8.75
No. 30	6.20 to 9.00
Tin-Mill Black Plate	
Nos. 15 and 16	4.15 to 7.05
Nos. 17 to 21	4.20 to 7.10
Nos. 22 to 24	4.25 to 7.15
Nos. 25 to 27	4.30 to 7.20
No. 28 (base)	4.35 to 7.25
No. 29	4.40 to 7.30
No. 30	4.40 to 7.30
Nos. 30½ and 31	4.45 to 7.35

PERSONAL

John W. Dougherty, third vice-president Crucible Steel Co. of America and president the Pittsburgh Crucible Steel Co., has retired from that connection to become president of the Marquette Iron Co. and an official of Dreitung & Co. Mr. Dougherty had served as president of the Pittsburgh Crucible Steel Co. for ten years.

W. L. Goodrich, Smithfield, Mass., has been appointed New England representative on the N. & G. Taylor Co., Philadelphia, in the sale of its forged steel.

Fred Wade, director of purchases for the Studebaker Corporation in Detroit, has been elected president of the Detroit branch of the National Association of Purchasing Agents. Other officers are: A. H. Schenk, general purchasing agent of the Burroughs Adding Machine Co., first vice-president; A. T. Harland, Charles A. Strelinger Machinery Co., second vice-president; R. G. John, McRae & Roberts, treasurer; W. H. Rudd, Square D Co., recording secretary; H. M. DeVries, Michigan Bolt & Nut Co., financial secretary; Elwood Sampson, editor Detroit *Purchasing Agents' Monthly*, publicity secretary.

John T. Higgins has resigned as night superintendent at the Haselton mills of the Sharon Steel Hoop Co., Sharon, Pa., to accept a similar position at the Western Reserve sheet mill plant at Warren of the Brier Hill Steel Co., Youngstown, Ohio.

R. C. Reuschaw, who for 13 years was general sales manager of the Reo Motor Car Co. of Lansing, Mich., and who for the last three years has been general factory manager of the Mitchell Motors Co., Racine, Wis., has returned to the Reo company to assume his former position.

J. F. Geary, formerly assistant superintendent Chicago plant, American Brake Shoe & Foundry Co., is now manager of manufacturing for the Federal Radiator Co., Zanesville, Ohio.

The Barber-Greene Co., standardized material handling machines, Aurora, Ill., has recently added another salesman, L. M. Dozier, to its force in St. Louis. Mr. Dozier was formerly with the Lakewood Engineering Co.

Co-incident with moving into its new plant, the Kelly Reamer Co., Cleveland, has made the following changes and promotions in the organization: A. H. Howard, formerly operating an independent office as the A. H. Howard Sales Engineering Co., joins the organization and will represent the company in the Cleveland, Toledo and the northern Ohio territory. R. W. Martindale, formerly with the E. A. Harper Tool & Supply Co., New York and Philadelphia, will handle the Pittsburgh territory. W. B. Leonard, formerly with the Standard Tool Co., will handle the Buffalo territory. A. J. Wadsworth, formerly of the New Process Gear Co., joins the company in the service department.

Gross Son & Robertshaw have been appointed sole selling agents for Wild-Barfield electric furnaces for the counties of Northumberland, Durham, Cumberland and Yorkshire, England. In addition to their office in Newcastle, Messrs. Gross Son & Robertshaw have opened a branch office at 41 Great George Street, Leeds, where a demonstration furnace is in course of erection. Macbeth Bros. & Co., Ltd., Bombay and Calcutta, have taken over the sole selling rights for India, where these plants are already in operation.

Robert G. Ashman has resigned as manager of the steel department of the Worcester Pressed Steel Co. to become the general manager of the J. D. Crosby Co., Pawtucket, R. I., manufacturer of cold rolled strip steel and flat wire. Mr. Crosby, who for some time had contemplated retiring from all business activities, will remain as president and in an advisory capacity.

J. F. Boyd, formerly with the Cyclops Steel Co., has been placed in charge of sales of the expanding reamers of the Wetmore Reamer Co., Milwaukee, in the Chicago district, which includes Illinois, Missouri, and northern Indiana. The Scully-Jones Co. will continue handling Wetmore products as heretofore. Mr. Boyd's office is at 846 Marquette Building, Chicago.

F. J. Evans, sales engineer Surface Combustion Co., gave a talk on "Combustion and the Industrial Furnace" before the members of the municipal section, Providence Engineering Society, Providence, R. I., Oct. 27. "Fuel Oil Burning Equipment" was the subject of Prof. Albert B. Coop, Brown University, before the student section of the society on Oct. 22. He gave its history and outlined its importance in industrial life.

Ralph K. Rowell, formerly equipment engineer at the International Motors Corporation, has severed his connection with them, to become a director and vice-president of Hubbard & Harris, Inc., consulting engineers, Bridgeport, Conn. He will interest himself particularly in their machine and equipment designing department.

George S. Davison, president Allen S. Davison Co., Pittsburgh, has been elected director of the Pittsburgh Chamber of Commerce to fill the unexpired term of A. M. Schoyer, who recently resigned.

D. R. Salisbury, who for some time represented the Allied Machinery Co. of America in England, and before that was local sales manager in New York, has sailed for Japan, where he will have charge of the company's business in the Far East.

R. Carlstedt, mechanical engineer of Stockholm, Sweden, inventor of the Arca pressure regulator, is now in the United States to make arrangements for the manufacture of the regulator in this country. The device is marketed by American Galco, Inc., Grand Central Palace, New York.

Albert Peech has been elected chairman of the United Steel Companies, Ltd., succeeding the late Harry Steel, whose death was noted in THE IRON AGE of Oct. 21.

OBITUARY

F. H. WHITTON, general manager Steel Co. of Canada, Hamilton, Ont., died at St. Joseph's Hospital, Hamilton, Oct. 24. Mr. Whitton failed to recover from a serious operation performed Oct. 21. He was born in Northamptonshire, England, 61 years ago, and spent his early youth in that country. He attended college at Cambridge, but at the age of 18 went to Canada and entered the employ of the Grand Trunk Railway at Montreal. He later went to the United States, but returned to Canada to assume the management of the Ontario Tack Co., which position he held until 1907. When the Steel Co. of Canada was formed Mr. Whitton was appointed assistant general manager, and in 1916 became general manager. Mr. Whitton is survived by his wife and one son, Corbett F. Whitton, assistant secretary of the Steel Co. of Canada.

JOHN R. ALLEN, 51 years old, director of the Bureau of Research of the American Society of Heating and Ventilating Engineers, died Oct. 26 at his home, 727 Summerlea Street, Pittsburgh. For 24 years he was dean of the Department of Mechanical Engineering, University of Michigan. He was a vice-president of the American Society of Mechanical Engineers and also a vice-president of the American Society of Heating and Ventilating Engineers.

CHARLES HENRY TODD, aged 59, organizer of the Petroleum Iron Works Co. and the Standard Tank Car Co., Sharon, Pa., died Oct. 24 of a complication of diseases. In 1892 he organized the Petroleum Iron Works Co. at Washington, Pa., and in 1906 the plant was

moved to Sharon, Pa. Ten years later he severed his connection with that company and established the Standard Tank Car Co., with which he was identified until 1917. Since then he had been prospecting for oil.

Daniel M. Wright

Daniel M. Wright, secretary-treasurer and general manager of the Henry & Wright Mfg. Co., Hartford, Conn., and president of the Universal Chain Co., Stroudsburg, Pa., died suddenly at the Hartford Hospital last week, following an operation. Although he had been in poor health for some months, no serious apprehension with regard to his recovery was felt until Sunday, Oct. 24.

Mr. Wright was one of the best-known machine tool manufacturers in the United States. He had taken a prominent part in the work of the National Machine Tool Builders' Association. His most recent business venture was the purchase last spring of the New York machine tool business of Hill, Clarke & Co., which has since been known as the New York Machinery Sales Division of the Henry & Wright Mfg. Co.

DANIEL M. WRIGHT

Mr. Wright was born in Philadelphia, July 5, 1870, and had lived in Hartford since 1874. He was educated in the Hartford public schools, and began his business life in a bookstore. Afterwards he was in the paper business and became an officer of the American Paper Co. He had a natural talent for mechanical work and helped to establish the Henry & Wright Mfg. Co., which has become one of the best-known makers of drilling machines. A few years ago Mr. Wright developed a dieing machine, for which he had predicted a great future. The machine tool trade will recall Mr. Wright's active interest in securing an agreement among machine tool manufacturers on what he considered the proper nomenclature in that industry. A "drill" he contended is the tool with which drilling is done, but it is not properly the name of a machine. So he proposed "drilling machine." Similarly he contended for "shaping machine," not "shaper"; also for "milling machine," "planing machine," and so on. He secured the general adoption of his proposals except in the case of the lathe, to which he gave the name "turning machine." The "dieing machine" referred to above as one of Mr. Wright's latest inventions would be described in the trade vernacular as a press for forming, stamping or drawing.

In Hartford business and political life Mr. Wright took his part. He was for one year president of the Hartford Board of Trade, and was a director in several business institutions.

He was a candidate for the State Legislature in 1912 on the Progressive ticket, and was a delegate to the national convention of that party in 1916. He leaves his wife, two sisters and a brother.

The Opportunity of the Engineer

A meeting to discuss "The Opportunity and Responsibility of the Engineer" in celebration of its fortieth anniversary will be held by the American Society of Mechanical Engineers, 8.15 p. m., Friday, Nov. 5, at the Engineering Societies Auditorium, 29 West Thirty-ninth Street, New York. Three speakers are announced: William B. Dickson, vice-president Midvale Steel & Ordnance Co.; Samuel Gompers, president American Federation of Labor, and J. Herbert Case, acting governor Federal Reserve Bank of New York. The positions of the speakers indicate that the topic is to be taken up from the standpoint of management, labor and capital.

Death of Gen. H. L. Haldeman

Horace Leander Haldeman, for nearly half a century connected with the pig iron business, and who lately retired from the presidency of the Pulaski Iron Co., Pulaski, Va., died Oct. 27 at his home at Marietta, Pa., from a stroke of paralysis. Mr. Haldeman was one of the best-known pig iron men in the United States, having been actively engaged in various branches of the business since 1872, when he entered the firm of E. Haldeman & Co., at Chickies, Lancaster County, Pa. This firm was succeeded by the Chickies Iron Co. and later by Haldeman, Grubb & Co., of which Mr. Haldeman was managing partner. In October, 1898, he sold his holdings and became vice-president of the Pulaski Iron Co., with offices in Philadelphia, later becoming president. He was at one time secretary of the Virginia Pig Iron Association. He was a director in the Western National Bank, Philadelphia, and also in the Reading & Columbia Railroad.

HORACE L. HALDEMAN

Mr. Haldeman was born at Locust Grove, Lancaster County, Pa., Sept. 16, 1847, the son of Cyrus S. and Elizabeth Steman Haldeman. He was educated in the public and private schools of Philadelphia. He had scarcely finished school when he joined the Northern army in the Civil War, serving as first lieutenant, and later as captain of the Twentieth Regiment, Pennsylvania Cavalry. In recognition of his military experience, he was in later life appointed to the staffs of Governors Pennypacker, Stuart and Tener, of Pennsylvania, and at the end of his State military service of 17 years was retired with the rank of brigadier-general.

In addition to his business and military career, Mr. Haldeman took his part in Pennsylvania State politics. He was elected to the State Senate from his district and was a candidate for re-election this year.

He was a member of the American Institute of Mining Engineers, the American Iron and Steel Institute, the Franklin Institute of Philadelphia, the American Foundrymen's Association, the Philadelphia Foundrymen's Association and the American Society for Testing Materials.

In May, 1920, Mr. Haldeman sold his holdings in the Pulaski Iron Co. to Isaac T. Mann and others and retired from the presidency of the company. His retirement from business was made necessary partly because of ill health. However, his condition had lately improved, and his death was unexpected.

JOHN GUYER, aged 39, construction engineer Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., for the past 10 years, died in an accident to some scaffolding, Oct. 20, while supervising alterations to cranes at the Standard Plate Glass Co., Butler, Pa. Mr. Guyer was born in South Norwalk, Conn., but had lived in Montour Falls, N. Y., for the past 15 years.

THOMAS KENNEDY, 61 years old, secretary and general superintendent Sharon Foundry Co., Sharon, Pa., died at his home there Oct. 29. He was born in Girard, Pa., and had been a resident of Sharon since 1891.

The Keystone Structural Steel Co. of Milwaukee has been organized by O. Lubinsky and W. Roley, to engage in business as fabricator and designer of structural steel, with headquarters at 711 Chestnut Street. Mr. Lubinsky formerly was connected with the McClintic-Marshall Co., Pittsburgh, but more recently handled structural and reinforcing work for H. Schmitt & Sons, general contractors, Milwaukee. The new company intends to establish a fabricating shop early next year and has temporary quarters to accommodate requirements until that time.

Machinery Markets and News of the Works

LOWER PRICES URGED

Both Buyers and Dealers Want Downward Revision on Machine Tools

Present Business Conditions Will Be Discussed at Meeting of Builders Association Nov. 11-12

Pressure is being brought to bear increasingly on machine-tool manufacturers to reduce prices. This urging has come primarily from prospective buyers, but dealers have also brought to the attention of the tool builders the possibility that some business might be stimulated by price reductions. While tool manufacturers, with one or two exceptions, have rigidly adhered to their price schedules, it is known that reductions are being seriously considered. In some instances it has been decided that lower prices at this time would not be effective in increasing sales.

The price guarantee is being used frequently, and the period for which protection is given the customer is generally six months. Such price guarantees have even been given on tools shipped from stock.

At the meeting of the National Machine Tool Builders Association in New York on Nov. 11 and 12, the general business situation will be thoroughly discussed, and if there are to be price revisions on machine tools they probably will not come until after that meeting. It is the problem of labor costs which most seriously concerns the tool manufacturers. While reductions are being effected in the basic wage rates in some plants, it is mainly by increased production per man that the unit labor cost is being brought down. Such reduction, however, is largely offset at present by the fact that few, if any, machine tool plants are working full time.

More optimistic feeling prevails in the West, particularly Chicago and Milwaukee, where more inquiries are being received. In Cleveland the supply of second-hand tools is large and some dealers are reducing prices from 15 to 20 per cent.

Among the larger inquiries are: 10 lathes for the Dutch East Indies and some planers for Japan and Madagascar; 14 tools for the Wheeling & Lake Erie Railroad; 10 lathes for the West Lynn, Mass., plant of the General Electric Co.

One machine tool builder canvassed former customers to find the reason for their refusal to buy at this time. Ninety per cent attributed their waiting to the desire to observe the outcome of election.

New York

NEW YORK, Nov. 1.

Pre-election week has been unusually dull in the local machine-tool market. A special canvass made by one machine-tool manufacturer among his Eastern customers disclosed that fully 90 per cent of them gave the election as their reason for not buying at present. Inquiries are fairly numerous in some sales offices, but prospective buyers seem in no hurry to place orders. Briefly, the situation is one where both buyers and sellers are simply awaiting developments.

Activity among crane buyers is increasing and numerous orders that have been pending for some time are on the point of closing. There is a good demand for lifting magnets. The recent inquiry of the General Commercial Co., 291 Broadway, New York, for a 10-ton, 70-ft. span overhead traveling crane for domestic shipment has been postponed. The American Car & Foundry Co. is in the market for a 5-ton overhead traveling crane.

Among recent sales are: Cleveland Crane & Engineering Co., two 2½-yd. bucket cranes to Thomas W. Murray for the Hell Gate station of the United Electric Light & Power Co.; Whiting Corporation a 30-ton, 50-ft. span overhead traveling crane to the Southern Pacific Co. for San Francisco; Shepard Electric Crane & Hoist Co., three 1-ton single I beam cranes to the Pacific Fruit Express Co., Ogden, Utah; Chesapeake Iron Works, a 5-ton and 7½-ton, 40-ft. span overhead traveling cranes to Levering Brothers, Baltimore, Md.

The Wallace & Tiernan Co., Inc., 349 Broadway, New York, manufacturer of equipment for water and sewerage purification, industrial service, etc., has acquired the former plant of the Klaxon Co. at 194-228 Wright Street, Newark, N. J., with total floor space aggregating about 5000 sq. ft. The two main buildings will be equipped for general manufacture, including metal-working department, machine shop, etc. A third building will be utilized for power plant service. The purchaser will take possession about the first of the year, at which time the Klaxon Co. will remove to Bloomfield, N. J., occupying a portion of the former plant of the International Arms & Fuze Co., recently acquired by the General Motors Co., of which the Klaxon Co. is a subsidiary. The Wright Street site has 11 lots, 25 x 100 ft. each, in addition to the main plant site, to be used by the Wallace & Tiernan Co. for expansion when necessary.

The Railway Motors, Inc., New York, has been incorporated with a capital of $60,000 by W. D. A. Rose, L. Prasher and H. S. Gray, 598 West 191st Street, to manufacture motor truck frames, parts, etc.

The C. M. Sorensen Co., 177 East Eighty-seventh Street, New York, manufacturer of electric air compressors and kindred products, has increased its capital from $30,000 to $200,000.

The American Can Co., 120 Broadway, New York, will hold in abeyance the erection of its proposed new plant at Baltimore, Md., and will call for new bids in the spring. The structure will be four-stories, 88 x 210 ft., estimated to cost about $350,000.

The additions to the rapid transit railroad shops at the Lenox Avenue and 148th Street yards, New York, to be erected by the Transit Commissioners, 49 Lafayette Street, will be equipped for car repair work. The new shops will cost about $456,000.

The General Lens Co. and General Optical Co., Mount Vernon, N. Y., associated, have plans under way for a new plant at Tilton, N. H. Woodwell & Resler, 501 Fifth Avenue, New York, are architects.

The Electro-Steel Products Corporation, New York, has been incorporated with an active capital of $25,000, by J. S. Slattery, J. C. Warren and R. E. Weldon, 1475 Broadway, to manufacture steel specialties.

The George Dose Engineering Co., 43 West Twenty-seventh Street, New York, is razing a structure at 529-33 West Fifty-fifth Street preparatory to the erection of a two and three-story automobile works, estimated to cost about $175,000. Plans have been prepared.

Fire, Oct. 22, destroyed hoisting equipment and other machinery at the plant of the United American Iron & Steel Co., South Troy, N. Y., with loss estimated at about $6,000.

The Standard Oil Co., 26 Broadway, New York, has taken title to about 28 acres at Canton, Md., adjoining its present refinery, which will be used for the construction of a new plant, estimated to cost in excess of $5,000,000, with machinery.

The Westinghouse Electric & Mfg. Co., 165 Broadway, New York, with plant at East Pittsburgh, Pa., has arranged for a bond issue of $30,000,000. Guy E. Tripp is chairman of the board.

A. L. Flint, general purchasing officer Panama Canal, Washington, will receive bids until 10.30 a. m., Nov. 15, for pneumatic hoist, anchors, axes, reamers, chisels, wrenches, bolts, files, clamps, hacksaw blades, cargo hoister blocks, snatch blocks, tackle blocks, etc., as set forth in Circular 1416. Blanks may be obtained at the main office or at the office of assistant purchasing agent, 24 State Street, New York.

Property of the Knickerbocker Motors, Inc., Poughkeepsie, N. Y., including machinery and other assets, will be sold by David W. Kahn, receiver.

The Lease Motors Co., Long Island City, N. Y., has been formed by a consolidation of the Lease Motors Co. and the D. D. D. Corporation, with capital of $1,800,000, to manufacture automobiles and equipment. I., R. M. and A. Lease, Long Island City, head the company.

The Athens Engineering Co., New York, has been incorporated with a capital of $20,000, by L. and L. B. Boossin and A. G. Norique, 623 West Seventeenth Street, to manufacture mechanical specialties.

The Savage Arms Corporation, 50 Church Street, New York, has resumed operations at its plant at Sharon, Pa., with curtailed rate of production. At its Utica, N. Y., plant operations are at capacity. W. L. Wright is president.

The Master Rule Mfg. Co., 841 East 136th Street, New York, has plans under way for a five-story building, 75 x 100 ft., adjoining its works.

The Goodyear Tire & Rubber Co., 123 West Sixty-fourth Street, New York, is arranging for a note issue of $10,000,000. It is now operating its Akron, Ohio, plants on a production schedule of 12,000 tires per day, with four-day week.

The United Electric Light & Power Co., 130 East Fifteenth Street, New York, has completed plans for its new electric generating plant on property recently acquired on 134th Street and the East River, estimated to cost in excess of $4,000,000 with machinery. Thomas E. Murray, Inc., 55 Duane Street, is engineer.

W. H. Cotton, Inc., Woolworth Building, New York, manufacturer of automatic machinery, has filed schedules in bankruptcy with liabilities of $192,841 and assets of $397,335, consisting of machinery and tools, accounts due and work in process.

The Barber Asphalt Paving Co., 233 Broadway, New York, has awarded a contract to Levering & Garrigues, 552 West Twenty-third Street, for a new two-story brick and concrete plant at Maurer, N. J., to replace a portion of the works recently destroyed by fire with loss of $1,000,000, including equipment. The rebuilding will include a new power plant.

The machine shop of the Warner Sugar Refining Co., Edgewater, N. J., and the adjoining automobile service works of J. J. McGarry, were destroyed by fire Oct. 24, with loss estimated at $50,000.

The Southern Pacific Co., 165 Broadway, New York, denies the report that it is planning to expend $12,000,000 on its lines, terminal and shop facilities in Mexico.

The Shaw Motor Car Co., 138 Roseville Avenue, Newark, has leased property at 353-63 Central Avenue, East Orange, N. J., for the establishment of a new automobile service works and repair shop.

The Failor-Martin Corporation, Bloomfield, N. J., has been incorporated with a capital of $100,000, by Arthur S. Martin, Thomas Sadler and T. I. Hershderfer, to manufacture hardware and cutlery specialties.

The Board of Education, Newark, has filed plans for the erection of a new vocational school at Sussex Avenue, Jay and First streets, four-stories, 163 x 225 ft., to cost about $1,050,000. It will include a machine shop, metal-working shop, electrical plant and other mechanical departments.

The Lauter-Humana Co., Sussex Avenue, Newark, manufacturer of player piano mechanisms, has acquired property adjoining its plant at Duryee Street and the Morris Canal, to be used for exfensions later.

The Magneto Repair Shop, 47 William Street, Newark, has filed notice of organization to manufacture and repair magnetos and ignition equipment. Louis Barnes, 348 High Street, heads the company.

The Roseville Automobile Repair Co., Newark, has filed notice of organization to operate a machine works and automobile repair shop at 47 South Twelfth Street. Harold G. Jennings heads the company.

The Vreeland Motor Co., 407 Elizabeth Avenue, Newark, manufacturer of motor trucks, has arranged for a stock issue aggregating over $200,000.

Buffalo

BUFFALO, Nov. 1.

The Angola Tire & Rubber Co., 270 North Division Street, Buffalo, has awarded a contract to J. A. Zoll, 398 Bird Avenue, for a new two-story plant, 96 x 126 ft., to cost about $55,000.

The J. A. Webb Belting Co., Buffalo, has increased its capital from $25,000 to $50,000.

The Great Lakes Battery Service Corporation, Buffalo, has made application to the City Council to operate an automobile service and repair works at 1141-43 Main Street, and will erect a two-story brick and concrete plant, 49 x 160 ft. The company is headed by Walter E. Williams and Emery S. Tucker.

The Clark Hardware Co., 109 North Main Street, Jamestown, N. Y., manufacturer of hardware products, etc., has increased its capital from $75,000 to $250,000.

Sarachan & Rosenthal, 46-50 Industrial Street, Rochester, N. Y., have completed plans for a new one-story metal-working plant, 40 x 100 ft., to cost about $22,000.

The Standard Oil Co., New York and Elk streets, Buffalo, has awarded a contract to the J. W. Cowper Co., Fidelity Building, for a four-story addition to its oil works, 105 x 115 ft., to cost about $150,000.

The Rochester Castings Corporation, Rochester, N. Y., is taking bids for a new one-story brick and steel foundry, 120 x 400 ft., instead of 275 x 1000 ft., as previously announced. J. F. Ancona, Cutler Building, is architect.

The Clay Cutlery Co., Andover, N. Y., has filed plans for rebuilding its present plant, with extensions.

It was erroneously stated in our issue of Oct. 14 that operations at the plant of the Lock Insulator Co., Victor, N. Y., recently acquired by the General Electric Co., would be discontinued and would form a part of the works of the latter company's plant under construction at Baltimore. Improvements and additions are now under way at the Victor plant and operations will continue as heretofore.

New England

BOSTON, Nov. 1.

What few lists are issued receive unusual attention and elicit much competition, so scarce is new business. The General Electric Co., West Lynn, Mass., on Oct. 26 put out the following list of lathes for its experimental department: Four 12-in. x 5-ft., four 14-in. x 6-ft. and two 16-in. x 6-ft., all motor driven and geared head. This company is also cleaning up on some of the smaller tools previously inquired for.

There are still a few bright spots in the market. For instance, one prominent Boston house sold more tools last week than for any week in two months, most of the sales being of single machines, though a few sales were in pairs.

Generally, the trade remains depressed. Most builders are rushing to make deliveries before buyers have time to cancel. Requests for cancellations are usually not honored unless the delivery be overdue. This haste to complete manufacturing to forestall cancellations also hastens the day when the plant must shut down unless new business is forthcoming. Cancellations from far away countries are usually honored at once because of the difficulty of collection. Some Japanese buyers have canceled recently.

Vermont and New Hampshire builders are often running on four-day schedules. The tendency is to reduce wages and forces. One Springfield manufacturer has reduced to a 40 per cent normal force and is getting 200 per cent output. Collections are very difficult.

Work has been started on the plant for the Prest-O-Lite Co., Cambridge, Mass., manufacturer of gas tanks, etc. There will be thirteen one-story buildings costing $150,000. Contract has been awarded to the Scully Co., East Cambridge.

Plans are being drawn for a $15,000 welding shop for the Portsmouth, N. H., Navy Yard. It will be of brick, two stories, 30 x 53 ft. No new equipment will be used.

Work has started on a garage and repair shop at Munroe and Fifth streets, Cambridge, Mass., for the Standard Oil Co., 26 Broadway, New York. It will be five stories, 20 x 138 ft., and cost $250,000.

Work has started on the warehouse, garage and machine shop at Somerville, Mass., for the Great Atlantic & Pacific Tea Co., Jersey City, N. J., to cost $700,000. It will be one, two and five stories, 110 x 360 ft.

Work has been started at Quincy, Mass., on the two-story machine shop addition, 74 x 76 ft., for the Pneumatic Scales Corporation. It will cost about $20,000.

A 40 x 60 ft. addition to the plant of the Chapman Machine Co., Terryville, Conn., has been prepared by Sperry & Buell, engineers, 175 Main Street, Bristol, Conn.

The Montague Co., Turners Falls, Mass., has awarded the Foundation Co., New York, contract for the construction of a machine shop, one story, concrete, brick and steel, costing $125,000.

Work will be started in the spring on a reinforced concrete foundry at Portland, Conn., for Wilcox, Crittenden & Co., Middletown.

A one-story addition, 18 x 34 ft., has been started by the Connecticut Construction Co. for the plant of the Crescent Fire Arms Co., Norwich, Conn.

The Manufacturers Foundry Co., Waterbury, Conn., has increased its capital stock from $200,000 to $400,000.

The Thomas Smith Co., punch and bolt manufacturer, has awarded contract for a $7000 addition to its recently-purchased plant at 288 Grove Street, Worcester, Mass. It will be 34 x 62 ft., one story, U-shaped, brick and steel. Equipment is being moved from its old location at 13 Cypress Street to the new plant.

The American Can Co., 120 Broadway, New York, has plans under way for the erection of a new brick and steel plant at Boston, to cost about $250,000 with machinery.

The DeCurtis Permutation Lock Co., Medford, Mass., has been incorporated with a capital of $25,000 by Frank DeCurtis and Frederick A. Komlosy, Medford, and Louis M. Spencer, Malden, to manufacture special locks and locking devices.

The Bullock Machinery Exchange, 528 Grosvenor Building, Providence, R. I., has filed notice of organization to manufacture machine parts. Horace H. Hendrick, 10 East George Street, heads the company.

The West Haven Mfg. Co., 22 Elm Street, West Haven, Conn., manufacturer of hack saws, etc., has plans under way for the erection of a two-story addition to cost about $12,000.

The Goyer Co., Inc., Hartford, Conn., manufacturer of electrical and hardware specialties, has acquired property at Willimantic, Conn., for the establishment of a new plant, and machinery will be installed in the building at once. It is proposed to remove the Hartford works to Willimantic.

The Berlin Foundry & Machine Co., Berlin, N. H., has filed plans for a two-story foundry addition, 60 x 110 ft., to cost about $85,000.

The Central New England Railroad Co., New Haven, Conn., is planning for additions and improvements in its shops, engine building and yard facilities at Maybrook, N. Y., to cost about $300,000.

The Auto Gear Co., Boston, has filed notice of organization to manufacture gearing for automobile service. Charles E. Hamilton, 1151 Commonwealth Avenue, heads the company.

The American Tube Works, 440 Somerville Avenue, Somerville, Mass., has awarded a contract to the Whidden-Beekman Co., 100 Boylston Street, Boston, for a one-story brick and steel addition, to cost about $75,000.

The Beacon Folding Machine Co., Lynn, Mass., has been incorporated with a capital of $100,000 by Otis L. Upham, Thomas C. Rowen and Hiram E. Miller, to manufacture machinery and parts.

The S. W. Card Mfg. Co., Mansfield, Mass., manufacturer of taps, reamers, etc., has filed plans for extensions and improvements in one of its buildings, to cost about $20,000.

Rolls-Royce of America, Inc., Springfield, Mass, manufacturer of automobiles, is arranging to increase its working force by about 150 men. Up to the present time about 500 operatives have been engaged, primarily on parts manufacture. Operations in the assembling department will begin at once and the additional employees will be used in this branch. At the main works in England, orders on hand are said to insure capacity manufacture until well into 1922.

The Springfield Nokol Oil Burning Co., Inc., Holyoke, Mass., has been incorporated with a capital of $50,000 by Patrick F. Carmody, Kraig J. Yoerg and Harry Mason, all of Holyoke, to manufacture oil burners and oil burning equipment.

The Kennebec Paper Co., Bangor, Me., has acquired a building at Augusta, Me., which it will equip with grinding machinery and auxiliary apparatus for ground pulp production, in connection with its new works at this point.

Philadelphia

PHILADELPHIA, Nov. 1.

The Standard Crown Co., Hope and Palmer streets, Philadelphia, manufacturer of metal bottle tops, etc., has awarded contract to Alexander Chambley, 2057 Summer Street, for its two story plant, to cost about $100,000, at Mascher and Clearfield streets. It will be 65 x 210 ft., instead of 61 x 120 ft., as previously announced. It is understood that erection will be deferred for a time.

Plans have been completed for a new one story brick power plant, 50 x 100 ft., to cost about $52,000 by the Glen Knitting Mills, Second and Westmoreland streets.

The Lojacono Sugar Cane Planter Co., Eddystone, Pa., has been incorporated with a capital of $100,000 by Frank Lojacono and Lorello Derumcio, Eddystone, to manufacture sugar cane machinery and parts.

Machinery to cost in excess of $40,000 will be installed by the New Jersey Tile Co., Muirheid Avenue, Trenton, N. J., at its new plant at Brunswick Avenue and Goulding Street, now in course of erection. Francis M. Walker is president.

Charles W. Brick, Crosswicks, near Trenton, N. J., has been granted permission to construct a new electric light and power plant for local service. Plans will be prepared at once.

The Stalium Metals Corporation, 226 Lafayette Building Philadelphia, is preparing a list of equipment to be installed in its new plant at Chester, Pa. The initial building is estimated to cost about $60,000, and will be supplemented by additional structures, plans for which are in preparation. The company was recently incorporated with a capital of $2,500,000. S. S. Staley is president.

The Universal Tool Co., Jeannette, Pa., has been incorporated with a capital of $50,000 to manufacture tools, machine parts, etc. William M. Adams, Jeannette, is treasurer and J. J. Wisner and Charles Wright, directors.

The following public utility companies have made application to the Public Service Commission, Harrisburg, Pa., for permission to issue securities in the amounts noted, the proceeds to be used in part for proposed extensions and improvements to electric power plants and distributing systems: The Metropolitan Edison Co., Reading, $65,000 in bonds; Philadelphia Rapid Transit Co., Philadelphia, $390,000 in bonds; Glen Rock Electric Light & Power Co., Glen Rock, $80,000 in stock.

The Schwartz Motor Truck Co., Chestnut Street, Reading, Pa., specializing in the production of 1½, 2½ and 5-ton motor trucks, has awarded contract to Paul F. Huber, Reading, for the first unit of its new plant in the Caldbrook district, 90 x 450 ft., brick and steel, and estimated to cost about $40,000, exclusive of machinery. The company has 10 acres in this section, and proposes to construct other units at a later date. The aggregate capacity of the entire plant, as now outlined, is estimated at $1,000,000 in monthly valuation of output. Harry B. Schwartz is president.

Operations have been discontinued at the New Jersey and Pennsylvania shipyards of the Pusey & Jones Co., Gloucester City, N. J.

John Meigs, Philadelphia, former assistant director of the local department of wharves and docks, and associates, have organized a company to establish a ship construction and repair works in the vicinity of Gloucester City, N. J., and have secured options on a site on the Delaware River, near the Reading ferry. Plans are being prepared for machine shop, metal-working shops, woodworking department and large floating drydock. R. E. Havens, 507 Federal Street, Camden, N. J., is engineer.

The additions to the plant of the Phœnix Iron Works, Meadville, Pa., manufacturer of boilers, tanks, etc., will consist of a one-story extension, 50 x 300 ft., to an existing main plant unit, and five-story structure 40 x 100 ft., for pattern work and other departments. The H. K. Ferguson Co., Euclid Avenue, Cleveland, has the contract.

Pittsburgh

PITTSBURGH, Nov. 1.

The machinery trade in this district still is marking time. While some of the dealers report a freer buying, one company having sold a complete outfit for a sawmill and several individual tools, this is the exception rather than the rule. Expectation of lower prices tends to make buyers conservative and to be more interested in second-hand tools to tide over their immediate needs. Manufacturers of steel mill equipment are fairly busy on old orders and report a fair inquiry from foreign countries, but new business from that source and domestic quarters is extremely light. Crane inquiries have dwindled sharply. Requests for prices even for estimating purposes are not so numerous as a short time ago. The trade in general is not looking for any appreciable improvement in business until the readjustment of iron and steel prices has been completed, and there is some definite basis upon which to do business.

The Pittsburgh Malleable Iron Co., Thirty-fourth and Smallman streets, Pittsburgh, manufacturer of iron and steel castings, is having plans prepared for a new one-story foundry, 200 x 320 ft., at Fifty-seventh Street and the Allegheny River, to cost about $350,000 with equipment. Frank D. Chase, Inc., 345 North Michigan Avenue, Chicago, is architect.

The Sterling Curtain Holder Co., Pittsburgh, has been incorporated with a capital of $40,000, to manufacture metal specialties. George Baskevich, 876 Progress Street, is treasurer.

Heyl & Patterson, Inc., 51 Water Street, Pittsburgh, manufacturer of elevators, hoists, etc., has awarded a contract to Golden & Crick, 3512 Fifth Avenue, for a new two-story plant to cost about $60,000.

Fire, Oct. 19, at the mechanical works of the West Penn Power Co., Springdale, near Pittsburgh, destroyed the machine shop and ice manufacturing plant with equipment, automobile service works and other buildings. The loss is estimated at $150,000.

The Wick Auto Construction Co., Pittsburgh, is being organized by Harry L. Wick, A. L. Pretty and Ellsworth Jordan, to manufacture automobiles and parts. The company is represented by Robert B. Ivory, 1156 Frick Annex. Application has been made for a State charter.

The South Hills Hardware Co., South Hills section, Pittsburgh, manufacturer of hardware specialties, has awarded contract to the Central Homes Co., Vandergrift Building, for a four-story building, 40 x 62 ft.

Fire, Oct. 22, destroyed a portion of the reduction plant of the H. Koppers Co., Fifth and Harriet streets, Rankin, near Pittsburgh, with loss including buildings and machinery estimated in excess of $80,000.

The Fiber Gas Mantel Co., 108 Diamond Street, Pittsburgh, has made application for a State charter to manufacture electric and gas fixtures, reflectors, etc. It is headed by Ernest Goff, C. O. Emerick and S. E. Tilbrook.

The McKenna Brass & Mfg. Co., First and Ross streets, manufacturer of automatic bottling machinery, etc., has recently acquired the plant and business of the Joseph F. Haller Co., Chartiers and Cliff streets, manufacturer of similar machinery, which it will operate as branch works.

The Pittsburgh Gage & Supply Co., Thirtieth and Liberty streets, Pittsburgh, manufacturer of electrically operated washing machines, etc., has awarded a contract to the Austin Co., Union Arcade, for a new one and one-half story building, 140 x 140 ft., to cost about $175,000.

The Oil Well Supply Co., 215 Water Street, Pittsburgh, manufacturer of oil drilling machinery, is planning the erection of a new machine shop to cost about $150,000, on site recently acquired.

The Berry Metal Co., New Brighton, Pa., and the Knott & Harker Co., Beaver Falls, Pa., manufacturers of machinery and parts, have been consolidated under the latter name. Operations will be concentrated at the Beaver Falls plant with increased facilities.

The Federal Foundry Supply Co., 2633 East Seventy-ninth Street, Cleveland, has acquired five acres at North Charleroi, Pa., for about $25,000. Plans are under way for a new foundry to cost about $65,000, which is expected to be ready for service by the first of the year.

The Eastern Foundry & Machine Co., Ambler, Pa., has completed plans for a new one-story plant, 65 x 115 ft. at Fernwood, Pa., to cost about $22,000.

The Wheeling Machine Products Co., Wheeling, W. Va., has increased its capital to $200,000.

The Pennsylvania Railroad, Philadelphia, has completed plans for new car repair works at East Wheeling, W. Va., estimated to cost, with equipment, in excess of $1,000,000.

The Mountain State Coal Co., Huntington, W. Va., has had plans prepared for a new one-story electric power plant at Coal Lands, Ritter, W. Va. C. T. Benton is president.

The Star Car & Foundry Co., Huntington, W. Va., recently incorporated with a capital of $750,000, will comprise a merger of the Ohio Valley Mine Car & Mfg. Co., Huntington, and the Star Car & Mfg. Co., New Lexington, Ohio. It is planned to concentrate operations to a large extent at the Huntington plant, and plans are under way to increase the capacity from 40 to 100 steel mine cars per day. J. C. Shirer is president.

The Hancock Steel Co., Hancock, Md., has been incorporated under West Virginia laws with capital of $500,000 to manufacture iron, steel, manganese, brass and bronze products. It has acquired a site at Brosius, W. Va., on the Potomac River, opposite Hancock, and has plans under way for a new plant. It is proposed to give employment to about 500 men for initial operations. J. Frank Shields is president, and Roy N. Daniels, secretary-treasurer, both of Hancock.

The Parkersburg Iron & Steel Co., Parkersburg, W. Va., has plans under way for the construction of additions to cost about $500,000, including improvements to present buildings and installation of new equipment. A large portion of the fund will be used for a new electric power plant and the purchase of electrical apparatus for general works service. C. F. Niemann is president.

The Chesapeake & Ohio Railroad Co., Richmond, Va., has plans under way for extensions to its shops at Huntington, W. Va., to cost $1,500,000, with equipment. A machine shop will be erected at a cost of about $500,000, and a structure for freight car repair work.

Indiana

INDIANAPOLIS, Nov. 1.

The Visible Pump Co., 402 Central Building, Fort Wayne, Ind., is taking bids for its new plant at New Haven, Ind., for the manufacture of special pumping devices.

The Interstate Public Service Co., Board of Trade Building, Indianapolis, is planning for the erection of new car shops at Scottsburg, Ind., to cost about $250,000 with equipment.

The Newman Foundry Co., Kendallville, Ind., has increased its capital stock from $25,000 to $50,000.

The Rice Improved Valve & Mfg. Co., Indianapolis, has been incorporated with $100,000 capital stock to manufacture valves and similar devices. The directors are Reece Rice, Albert Wenner, C. R. Reynolds, B. C. Reed and W. S. McMaster.

The Alexandria Metal Products Co., Alexandria, Ind., has been incorporated with $75,000 capital stock to operate a foundry and machine shop. The directors are J. W. Joseph, Henry Abrams and P. H. Frey.

The Universal Conveyor Co., South Bend, Ind., has been incorporated with $25,000 capital stock to manufacture conveyors. The directors are Irwin D. Landis, L. S. Landis and Lafayette L. Porter.

The Anderson Die & Model Co., and the Twin Coaster Co., Anderson, Ind., have been merged and will manufacture children's vehicles. The capital stock is $100,000.

Cincinnati

CINCINNATI, Nov. 1.

There have been no developments in the machinery market the past week. Some inquiries, mostly for single machines, are being received, but are taken by manufacturers in the nature of "feelers" on prices. Some bona fide inquiries for export have appeared, among them 10 lathes for the Dutch East Indies and planers for Japan and Madagascar, which will probably develop into orders. Manufacturers admit that a large number of purchases are being held up in the expectation of lower prices, but so far no move has been made toward a revision. Reports have been current that to get orders a five per cent discount has been allowed the purchaser, but these are denied by manufacturers. A number of railroad lists are still pending, and it is understood that the Cambria Steel Co. has decided to postpone buying for a couple of months. Deliveries have improved, and at least one local manufacturer of lathes is now placing part of his output in stock. Heavy shipments for export continue and this week a drilling machine manufacturer shipped a number of machines to France and Italy. The Far East is also taking tools. Some cancellations have been received from South American countries, deliveries on which had been about one year behind and on which the prices to be paid would about represent manufacturing costs of to-day.

Shops generally are working full time, but are not taking on new men. Local foundries report further slowing up of business and some are preparing to run three days a week, beginning to-day.

The Cincinnati Shaper Co., Cincinnati, has recently completed the erection of a new building adjoining its plant at Elam Street and Garraud Avenue. Machinery is being installed and it is expected that production will be under way before December 1.

The King Machine Tool Co., Cincinnati, manufacturer of boring mills, has about completed an addition to its plant, and is installing machinery. When the whole plant is in operation the capacity will be doubled. The company has also erected a new office building.

The Worthington Pump & Machinery Corporation, New York, is receiving estimates from Cincinnati contractors for an addition to its Laidlaw Works at St. Bernard, a Cincinnati suburb. It will be one-story, 50 x 75 ft., and will be used as a cleaning room.

The Kelly-Springfield Motor Truck Co., Springfield, Ohio, has been authorized to increase its capitalization from $6,000,000 to $8,000,000.

The Consumers Supply Co. of Ohio, Greenville, Ohio, has purchased the Daisy Fence Post Co., Lafayette, Ind., and in the near future the output of the latter company will be manufactured in Greenville. Contract for a new factory has been let and it is expected that the plant will be in operation about the first of the year.

The Climax Rubber Co., Columbus, Ohio, has purchased the plant of the K. & W. Rubber Co., Delaware, and it is understood that the plant now operated by the Climax company at Huntington, W. Va., will be removed to the former place. The offices will be moved to Delaware from Columbus.

Cleveland

CLEVELAND, Nov. 1.

The Wheeling & Lake Erie Railroad has issued a list of machines, including six lathes, two drilling machines, two planers, two punching machines and two air compressors. This is the only inquiry of any size which developed the past week.

Dealers report a few inquiries for single machines, mostly in small sizes, but many prospective purchasers want used machinery and are shopping for bargains. Quotations on used machines generally are lower and some sales are being made at very attractive prices to the buyer. A few second-hand tool dealers have cut prices on listed machinery from 15 to 20 per cent. The supply of used machines is fairly large. Some managers are going over their equipment and picking out tools they do not need and placing them on the market.

The Hollis Tractor Co., Tiffin, Ohio, is planning to erect two new factory buildings, and will also remodel other structures on a site recently purchased.

A new plant will be erected in Wooster, Ohio, by the Success Dishwashing Co., which has been reorganized with F. W. Blough, president and Harry L. Palmer, secretary-treasurer.

The Louisville Machine & Mfg. Co., Louisville, Ohio, has increased its capital stock from $150,000 to $500,000 to take care of enlarged business.

The Raines Engineering Co., New Philadelphia, Ohio, has opened a plant in the building formerly occupied by the Henkel Mfg. Co. and will manufacture tractors.

The Defiance Motor Truck Co., Defiance, Ohio, has recently made some changes in its organization. C. H. Kettering is president; J. C. Ayers, vice-president; H. R. Morse, secretary; J. F. Robertson, treasurer, and F. W. Warrington, general sales manager.

The Milburn Wagon Co., Toledo, Ohio, will erect a new plant for the manufacture of electric automobiles on the site of its former works on Monroe Street. It is said that this plant will more than treble the company's present capacity for turning out electric cars.

The Brown Clutch Co., Sandusky, Ohio, plans to erect a foundry, 100 x 128 ft.

The Fisher Body Ohio Co., which is erecting a plant in Cleveland, will build a power house, 96 x 115 ft.

Chicago

CHICAGO, Nov. 1.

Although there has been little change in the business situation, sentiment is somewhat more optimistic, as a number of fair-sized inquiries have appeared and many believe that a turn in trade is in sight. Heretofore reductions in prices have been regarded as unlikely because of high manufacturing costs, but that costs will be subject to adjustment is becoming evident as the downward movement in pig iron and independent steel prices grows more pronounced. That manufacturers are giving due consideration to what can be done in the event of a substantial decline in the cost of materials is an open secret. It is regarded as significant that the date of the annual fall meeting of the National Machine Tool Builders' Association, to be held in New York, has been changed from Dec. 2 to Nov. 11. Should a general decline in prices occur within the next month or two it is felt that a period of active business will ensue. Even now a number of industrial plants which were hesitant about adding to their equipment a few weeks ago have bought certain machines for which they have an immediate need in their production programs. While this buying has been limited, it nevertheless indicates that some consumers have broken away from the ultra-conservatism which has been almost universal in recent weeks. An automobile plant has placed a $12,000 order and a cement company has bought to the extent of $5,000. A number of other purchases of this kind have been made. The Drake Hotel Co., Chicago, has issued an inquiry for a 16-in. x 10-ft. engine lathe, a 20-in. back-geared drill, a 10-in. two-wheel wet grinder, and a 16-in. shaper. The Santa Fe has added an inquiry for a 18in. x 10-ft. engine lathe to its pending lists. F. H. Moellenbrock, Washington, Mo., is in the market for a 14-in. drilling machine, a 14-in. x 6-ft. engine lathe, a 34-in. band saw and three emery grinders.

There have been no further purchases by railroads against pending inquiries, but dealers believe that it is only a question of time when action will be taken. A number of requests for suspensions on undelivered tools are being received, the largest coming from a large tractor manufacturer which, however, will accept immediate delivery on condition that payment be deferred until after Jan. 1.

The Federal Steel Furniture Co., manufacturer of steel lockers, 4541-61 Homer Street, Chicago, has let contracts for a two-story plant, 51 x 154 ft., to cost $12,000.

The Hercules Metalware Mfg. Co., 2010 Blue Island Avenue, Chicago, has been incorporated with $10,000 capital stock by Rubin Morensky, Jacob Block, Norman R. Moren and others.

The Weil-McClain Co., a reorganization of Weil Brothers, plumbers' supplies, 641 West Lake Street, Chicago, will construct a $300,000 plant at Michigan City, Ind., having obtained a loan for that amount from a local bank.

Jacob Press Sons, 300 North Halsted Street, Chicago, manufacturer of wagons, has let contracts for a one story factory, 125 x 250 ft., 3338-3360 Normal Avenue, to cost $80,000.

The La Salle Steel Co. has let contract for a one story steam heating plant, 200 x 500 ft., to serve its plant at Hammond, Ind., to cost $35,000.

The Ryan Car Co., Hegewisch, Ind., has let contract for a one story steel straightening shed, 40 x 120 ft., to cost $6000.

The Burns-Craft Co., Tacoma Building, Chicago, has let contract for a one story die casting plant, 129 x 150 ft., at 2229-39 Herndon Street, to cost $52,000.

The Union Stock Yards Casting Co. will construct a one story foundry, 60 x 125 ft., at 4935-53 South Morgan Street, Chicago, to cost $28,000.

The Battery Specialty Co., 6417 Sheridan Road, Chicago, has been incorporated with $5000 capital stock by Carl Behn, Jr., John and Cora McGlashan, to manufacture batteries, motor accessories, machinery, etc.

The Toymakers, Inc., 155 North Clark Street, Chicago, has been incorporated by F. W. Kramer, L. E. Olsen, Jules Urban, and others, to manufacture toys.

The Steel Fabricating Corporation is making headway in the construction of a $500,000 plant at Michigan City, Ind., and expects to complete it by Jan. 1. It has plants at Harvey and Chicago Heights, Ill.

The Wright-Fisher Bushing Co., Holly, Mich., contemplates erecting a plant to cost $250,000.

The Tinker Toy Co., Evanston, Ill., will construct a light manufacturing plant at 1532 Payne Street, as an adjunct to its main factory. It will be one story and cost $15,000.

The Swartz Iron Foundry, East Freeport, Ill., has bought the carnival show grounds, Taylor Avenue, comprising thirty-three city lots, and contemplates a new plant. The present site of the foundry is opposite the property just purchased.

The Central Railway Signal Co., 332 South Michigan Avenue, Chicago, has filed plans for a one-story building at Hammond, Ind., to replace a structure destroyed by fire, with cost estimated at about $23,000.

The Pioneer Automobile Co., 4638 Madison Street, Chicago, has completed plans for its new one and two-story

plant at Valparaiso, Ind., estimated to cost about $500,000 including machinery.

Bird & Son, Ashland Avenue and Seventy-sixth Street, Chicago, manufacturer of roofing specialties, has awarded contract to E. W. Sproul & Co., 2001 West Thirty-ninth Street, for a new one story and basement plant, 65 x 200 ft., on Ashland Avenue, to cost about $60,000. Headquarters of the company are at East Walpole, Mass.

The United States Register Co., Des Moines, Iowa, has filed plans for a three-story and basement building, 66 x 120 ft., at Fifth and Elm streets.

The Mechanical Rubber Co., 2635 West Grand Avenue, Chicago, has had plans prepared for the installation of a mechanical coal handling plant at its works, to cost about $25,000. Bids will be taken at once. S. B. Lincoln, 1235 South Dearborn Street, is engineer.

Milwaukee

MILWAUKEE, Nov. 1.

Machine-tool builders find considerable encouragement in the fact that metal-working companies in Wisconsin, generally outside of Milwaukee, are proceeding with new plants or shop extensions which will develop fairly sizable lists of machine tools and other equipment during the winter. While a continued hesitant buying attitude is noted, a better inquiry is reported and production is going forward at a satisfactory rate. While some builders have reduced operating forces, it is found that efficiency has increased to approximately that effected with the larger force.

The McIntyre-Burrall Co., Green Bay, Wis., manufacturer and jobber of saddlery, belting, etc., has acquired the hardware manufacturing department of the Wallace & Smith Co., 70 West Water Street, Milwaukee. The transfer will be made about Nov. 15, upon the completion of a new machine shop, 52 x 86 ft., as an addition to the present factory and warehouse of the McIntyre-Burrall Co. The new department will manufacture saddlery hardware, from snap chains to bridle buckles. For the present raw castings will be obtained from malleable and brass founders at Green Bay and vicinity.

The Moloch Co., Kaukauna, Wis., recently incorporated with $750,000 capitalization, is a consolidation of the Kaukauna Machine Works Co. and the Moloch Automatic Stoker Co. The new corporation will continue to manufacture as principal lines the two patented products of each, namely, the Mayer power hammer and the Moloch automatic-stoking device for boiler houses. As previously noted, ground has been broken for the first of two units of a new plant, each 80 x 300 ft. The officers are: President, Francis W. Grogan; vice-president, C. J. Davidson, Chicago; secretary, Lorenz Mayer; treasurer, F. M. Charlesworth.

The Chippewa Foundry & Machine Co., Chippewa Falls, Wis., has changed its corporate style to Chippewa Pump Co. It was established about a year ago and erected a foundry and machine shop. The change is made merely to describe more adequately the nature of the present business, which is the manufacture of steady stream pumps.

The General Motors Corporation, Detroit and New York, on Dec. 1 will concentrate its Samson motor truck operation at the new works of the Samson Tractor Co., Janesville, Wis., where an investment of nearly $4,250,000 already has been made.

The Armstrong Foundry Co., Racine, Wis., manufacturer of gray iron castings, has increased its authorized capitalization from $75,000 to $150,000 to accommodate the growth of the business incident to the enlargement of its shop the past six months. William H. Armstrong is president and general manager.

The Wisconsin Boiler & Heater Co., Milwaukee, has been granted a charter to manufacture hot water heating boilers and systems, designed and patented by Joseph Antonuccio. The capital stock is $25,000. Harry M. Wink and John C. Hensey, 730 Oakland Avenue, are associated with Mr. Antonuccio.

The Fox River Paper Co., Appleton, Wis., has started work on a two-story brick and steel mill and machine room addition, 30 x 185 ft., to cost about $115,000 with equipment. The project is in charge of Thomas Orbison, 812 College Avenue, Appleton, consulting and contracting engineer.

The Thor Machine Co., Racine, Wis., has amended its corporate articles to provide for an increase in capital stock from $20,000 to $60,000.

Maj. Henry C. Hengels, 425 East Water Street, Milwaukee, State military architect of Wisconsin, will take bids soon for the construction of a power plant and pumping station, 45 x 50 ft., at the State military reservation, Camp Douglas, Wis. The estimated cost is $50,000.

The Pardeeville Electric Co., Pardeeville, Wis., has been incorporated with a capital stock of $25,000 to build an electric light and power plant. The promoters are Joseph Chandler, H. A. Figor and John J. Wright.

The Classy Auto Deflector & Supply Co., Milwaukee, has been organized with $500,000 capital stock to manufacture headlight lenses and other automobile accessories and supplies. The incorporators are Henry M. Johnson, Mary Stockhausen and Andrew Gilbertson, attorney, 105 Wells Street.

The Shope Brick Co., Milwaukee, has plans by Backes & Pfaller, architects, 216 West Water Street, for a new brick and tile plant at Forty-seventh and State streets, to cost about $75,000. Contracts will be let this week.

The American Metal Products Co., 671 Kinnickinnic Avenue, Milwaukee, has decided to postpone until next spring the construction of a new foundry and machine shop on a site in West Allis. Plans prepared by George Staal, consulting engineer, will be held in abeyance. The works will cost between $100,000 and $125,000 and consist of a brass and gray iron foundry, 50 x 75 ft., and machine shop, 75 x 150 ft. The company manufactures brass and bronze castings exclusively, the product being known as Ampco bronze. Carl J. Zaiser is secretary and treasurer.

The George L. Hunt Mfg. Co., Boscobel, Wis., has been incorporated with a capital stock of $25,000 to manufacture automotive parts and materials. The incorporators are George L. Hunt, H. E. G. Kemp and Charles A. Blair.

The Miller Spouting Co., West Bend, Wis., a $150,000 corporation organized to manufacture a patented spouting for grain elevators, mills, etc., has decided not to build a new plant, having purchased an existing building which will be remodeled and equipped. Machinery is now being purchased.

The Phoenix-Parfrey Co., Prairie du Chien, Wis., has awarded the general contract to the Delos Engineering Co., local, for a brick and concrete wood-working plant, 80 x 90 ft., and a boiler house and power plant, 45 ft. sq., to cost about $45,000. George J. Lengs is manager.

The She-Boy Rubber Co. of Sheboygan, Wis., incorporated recently with $675,000 capital, is rebuilding and enlarging an existing factory for the manufacture of tires, tubes, protectors and mechanical rubber goods. Executive offices will be maintained at 176-182 Sixteenth Street, Milwaukee. The officers are: President and general manager, Leo Hofmeister, Milwaukee; vice-president, Daniel F. Knauth, Kiel, Wis.; secretary, E. A. Hickey, Sheboygan; treasurer, Corty M. Halderson, Valders, Wis. Production will begin about Feb. 1.

The Western Malleables Co., Beaver Dam, Wis., has placed in operation the sixth and last furnace of its three-unit plant to handle an increasing volume of business. This is the first time in more than two years that all of the furnaces have been in operation at one time. The Center Street shop has been undergoing improvement work during the past year and will handle small casting orders for railroads and the automotive industries.

The Fabricated Ship Corporation, Milwaukee, has started work on dismantling its plant and yard at the foot of Twelfth Street. It has completed its contract with the Government to build 13 fabricated steel ships, the last of which was delivered Oct. 28. The corporation was formed in June, 1918, by members of the Coddington and Newton Engineering companies, Milwaukee.

Baltimore

BALTIMORE, Nov. 1.

The Black & Decker Mfg. Co., Towson, Md., manufacturer of electrically operated drills, machinery, etc., has awarded contract to the Development & Construction Co., American Building, Baltimore, for a one-story machine shop, to cost about $50,000. It is understood that construction will be defefred until the first of the year.

The Western Maryland Railway Co., Baltimore, will install electrically operated machinery at its new coal pier, now in course of construction at Port Covington, Md., including hoisting, loading, conveying and other machinery. The pier will have a capacity of 40 cars per hour, or a daily output of about 25,000 tons, and is estimated to cost about $1,800,000 complete.

Levering Brothers, William Street and Key Highway, Baltimore, manufacturers of sash weights and similar specialties, have preliminary plans under way for a new plant at Severn and Monroe streets, to cost about $25,000.

The Miller Safe Co., Fremont Street, Baltimore, has increased its capital from $150,000 to $300,000. It is a subsidiary

of the York Safe & Lock Co., York, Pa., and has construction under way on a one-story plant, 124 x 398 ft., on Wilkens Avenue.

The W. C. Briddell Co., Inc., 1302 Continental Building, Baltimore, has been incorporated with a capital of $100,000 by William C. Briddell, Arthur E. Rudolph and Frank B. Ober, to manufacture rails, track equipment and other iron and steel products.

F. Phillips & Sons, 1336 Greenmount Avenue, Baltimore, manufacturers of tools, have awarded contract to C. C. Watts, 407 East Twenty-fifth Street, for a two-story and basement addition, 38 x 70 ft., to cost about $30,000.

The American Propeller & Mfg. Co., Gittings and Covington streets, Baltimore, has acquired about 87 acres near Elkridge, Howard County. No announcement has been made as to when the property will be used. Spencer Heath is president.

Plans for a one-story power house to cost $200,000 have been completed by the Columbia Graphophone Co., Baltimore, in connection with its new plant at Loney's Lane and Chase Street. It will be 85 x 100 ft.

The Eskridge Tire Co., Inc., 868 North Howard Street, Baltimore, has been incorporated with a capital of $100,000 by David R. Eskridge, Maurice R. Robinson and Frank Caplan, to manufacture automobile tires.

The Bartlett-Hayward Co., Scott and McHenry streets, Baltimore, manufacturer of machinery, has taken title to property at Wicomico and Clare streets, in the vicinity of its plant in the South section. Additional property was also acquired in this district recently, and the company is said to be planning for the expansion of the South section works.

The Spann Motor Co., Inc., Philadelphia and East avenues, Baltimore, has been incorporated with a capital of $225,000 by Charles A. and John D. Spann, to manufacture automobile parts and equipment.

The Norfolk & Western Railroad Co., Roanoke, Va., has plans under way for an addition to its electric power plant near Roanoke, to cost about $300.000 with machinery.

The Peerless Pole & Ladder Co., Greenville, S. C., has taken bids for a new plant near the city limits, 60 x 160 ft., to cost about $50,000. The J. E. Sirrine Co., Greenville, is engineer.

The Chesapeake & Ohio Railroad Co., Richmond, Va., has awarded contract to the Arnold Co., 105 South La Salle Street, Chicago, for new shops, engine house, power plant and ice-manufacturing plant at Cliftonforge, Va., to cost about $500,000 with equipment.

The Security Cement & Lime Co., Equitable Building, Baltimore, has plans under way for extensions to its cement manufacturing plant at Security, Md., to increase the daily capacity from 3000 to 6000 bbl. It is also considering the enlargement of its plant at Berkeley, W. Va. A. Loring Cover is president.

The Republic Boiler & Radiator Co., Maryland Casualty Tower, Baltimore, has been incorporated with a capital stock of $1,000,000, to manufacture steam and hot water boilers and heating apparatus. The incorporators are E. McClure Rouzer, Enos S. Stockbridge and William Lentz.

The Central South

ST. LOUIS, Nov. 1.

The St. Louis Screw Co., Clarence and Bulwer avenues, St. Louis, has filed plans for new one-story works at 6912 North Broadway, to cost about $60,000.

The St. Louis & San Francisco Railroad Co., St. Louis, has awarded contract to the Leake Construction Co., Chicago, for an addition to its car shops at Fort Scott, Mo.

The Foerster-Kaysing Iron Works, 2710 North Twenty-fifth Street, St. Louis, is planning for the erection of a one-story addition, 82 x 90 ft., on Montgomery Avenue.

The Wright-Dance Range & Furnace Co., Knoxville, Tenn., recently organized with a capital of $25,000, has awarded a contract to L. J. Powers, Knoxville, for a new one-story foundry, 70 x 130 ft., to cost about $18,000.

The Kentucky & West Virginia Power Co., Lothair, Ky., has arranged for a bond issue of $1,500,000, the proceeds to be used in part for extensions and betterments in electric plants. H. T. Hartman is vice-president and general manager.

Fire, Oct. 22, destroyed the plant of the Earle Compress Co., Earle, Ark., with loss estimated at $500,000, including cotton ginning equipment.

The Dixie Rubber Co., Randolph Building, Memphis, Tenn., manufacturer of mechanical rubber products, has awarded a contract to the Hydraulic Steelcraft Co., Sixty-first Street, Cleveland, for a new one-story plant, 75 x 290 ft. L. C. Cadenhead is general manager.

W. F. Stimson and J. S. Johnston, Louisville, are organizing a company to manufacture automatic measuring devices, pumping equipment, etc. Local property has been acquired and plans are under way for the erection of a plant, estimated to cost about $75,000.

The Chesapeake & Ohio Railroad Co., Richmond, Va., has plans under way for additions to its repair shops at Ashland, Ky., to cost about $1,000,000 with machinery.

The Measurite Co., Knoxville, Tenn., recently organized with a capital of $250,000, has acquired about 10 acres and has plans under way for works for the manufacture of automatic measuring machines. The initial plant is estimated to cost about $65,000.

The Scuddy Coal Co., Hazard, Ky., recently organized with a capital of $150,000, is planning for the erection of a new coal tipple.

The Chattanooga Iron & Coal Corporation, Chattanooga, Tenn., has increased its capital from $2,500,000 to $4,500,000.

Grinding equipment, jaw crushers, pulverizing apparatus, etc., to cost about $50,000, will be installed at the new plant of the Rock Hill Paint & Cloth Co., Webb City, Mo. The works will comprise a two-story building, 60 x 150 ft., with power house, 40 x 60 ft. Thomas Crooks is vice-president and general manager.

The Consolidated Fuel Co., Dalna, Ky., is planning for the erection of a new coal tipple at its properties.

The Victory Metal Co., Henryetta, Okla., is arranging to rebuild its plant, recently destroyed by fire with loss estimated at about $100,000.

A plant for the manufacturing of concrete pipe will be established at Joplin, Mo., by John Zeidler, St. Joseph, Mo.

The El Reno Ice Co., El Reno, Okla., P. G. Liebmann and others interested, is in the market for about $30,000 worth of machinery.

The Gulf States

BIRMINGHAM, Nov. 1.

At the annual meeting of the Mack Mfg Co., Ltd., Houston, Tex., manufacturer of oil field supplies, the capital stock was raised from $500,000 to $2,000,000, the extra capital to be used to build additions and install equipment in its plant at Houston, which includes a foundry, forge shop and machine shop. A branch factory is also to be built in northern Texas, or Oklahoma, for the manufacture of cable tool equipment. J. O. Mack is president and general manager; H. L. Sadler, secretary, and Charles R. Edwards, plant superintendent.

Fire, Oct. 18, destroyed the plant of the Texas Wheel & Body Co., Dallas, Tex., with loss estimated at about $75,000.

The Marley Gin Co., Riesel, Tex., is arranging for the erection of a new cotton ginning plant, to replace the structure recently destroyed by fire. Bids for construction and machinery will be asked early in 1921. F. E. Burney is manager.

The Superior Motor Works, Jackson, Miss., manufacturer of marine motors, is planning to establish a branch plant at Titusville, Fla.

The Gulf Refining Co., Hickory Street, Dallas, Tex., is planning for the erection of a new machine shop and mechanical works in connection with its new local distributing plant to cost about $100,000.

S. W. Oliver, Birmingham, Ala., and associates, have plans under way for the establishment of a new plant, for general machine work, eletcrical repair operations, machine parts, etc.

The Home Ice & Cold Storage Co., Austin, Tex., is planning for extensions in its refrigerating plant to cost about $200,000, including machinery. A. M. Fitzpatrick is president.

The Gulf Machinery & Investment Co., New Orleans, is in the market for a 200-hp. boiler.

The Walstrum Armature Works, Birmingham, Ala., has increased its capital stock from $10,000 to $25,000.

The Goodwear Tire & Belt Co., San Antonio, Tex., is building a plant at San Jose for the manufacture of automobile tires and other rubber products. The factory, including a 25-acre site, will represent an investment of $300,000. H. L. Fullerton is president of the company.

The New England Fuel Oil Co., Tampico, Mexico, will erect an additional 55,000-bbl. steel storage tank at its Tampico terminal, and will build a pipe line from San Manuel to its producing wells.

Detroit

DETROIT, Nov. 1.

The machine tool market continues dull. Few if any orders are being booked, although inquiries are increasing slightly, but all are relatively small.

All the machinery and equipment of the General Aluminum & Brass Co., in South Park, a suburb of Port Huron,

Mich., is being removed to the Detroit plant. It was reported that the company planned to enlarge the main works in Detroit rather than maintain branch plants in South Park and Marysville, Mich.

The Cheboygan Metal Products Co., Cheboygan, Mich., recently organized, has bought a warehouse and is having the structure remodeled. The machinery and equipment is ready to be installed. Among the products to be manufactured are spark plug testers, for which the company is said to have orders for several thousand.

The Burroughs Adding Machine Co., Detroit, will build a plant in Tiffin, Ohio, $15,000 in cash having been paid toward the purchase of a site.

The American Broach & Machine Co., Ann Arbor, Mich., will further enlarge its plant by the erection of a building, 40 x 120 ft. It has just finished an extension 40 x 100 ft. and when the proposed addition is completed the plant will be 160 x 512 ft.

The Reli Tool, Steel & Foundry Co., Plymouth, Mich., has increased its capital to $64,000.

The Sauzedde Mfg. Corporation, Mt. Clemens, Mich., manufacturer of wire automobile wheels, has completed plans for its new one story plant, 100 x 150 ft., estimated to cost about $75,000, including equipment. It is expected to begin construction at once.

The Detroit Steel Casting Co., Detroit, has increased its capital from $600,000 to $1,300,000.

The Sterling Construction Co., Detroit, has been incorporated with a capital of $125,000 by Frederick C. Van Slyke, 515 Ford Building, and Neal B. Woodruff, to manufacture iron and metal products.

The Allen Screen Co., 512 South La Salle Avenue, Detroit, has completed plans for the erection of one story and basement factory, 48 x 100 ft., on Bryden Avenue. Herbert C. Lawrence is secretary.

The West Foundry Co., Detroit, has been incorporated with a capital of $50,000 by E. Porter West, Frank W. Knott and C. Howard Crane, 2988 East Grand Boulevard, to manufacture iron and steel castings, and other metal products.

The Watkins Nut Co., Detroit, has been incorporated with a capital of $50,000 by George J. Libby, Glen D. Welcher and Frank D. Watkins, 152 Gladstone Street, to manufacture bolts, nuts and kindred specialties.

The Sterns Register Co., 111 East Fort Street, Detroit, manufacturer of air registers, etc., is taking bids for a new one story and basement plant, 100 x 185 ft., on Twelfth Street. Isaac Sterns is president.

The Poll-Ells Aeroplane & Motor Corporation, Detroit, manufacturer of airplane engines, parts, etc., has filed notice of change of name to the Poll-Ells Corporation, increasing its capital from $250,000 to $5,000,000. It has arranged for the establishment of a new plant at Clinton and Watson streets, Buffalo, for parts manufacture and assembling.

The Multiple Tool Co., Grand Rapids, Mich., has filed notice of dissolution under State laws.

The Detroit Sewing Machine Co., Detroit, has increased its capital to $300,000.

The Handy Governor Corporation, Detroit, has increased its capital from $25,000 to $50,000.

Canada

TORONTO, Nov. 1.

The Mongolia Metal Co. of Canada, Montreal, has started work on an addition to cost $25,000 exclusive of equipment. When completed the extension will enable the company to triple its output.

A four-story addition is being made to the plant of the Fisher Body Co. of Canada, Ltd., Walkerville, Ont., and will be completed about the first of the year. The new building will give an additional 75,000 ft. of floor space and will cost $275,000.

The Britannia Rope Co., a subsidiary of the British company of the same name, has recently completed its factory on Granville Island, B. C., and is installing machinery for the manufacture of wire rope for the Canadian market. While the wire for making the rope is now being imported from England, the Canadian company intends eventually to import its own steel and draw its necessary wire at the Granville Island plant. The managing director of the Canadian branch is Robert Gibson, Vancouver, B. C.

The Waldorf Paper Products Co., Winnipeg, is building a two-story addition, 20 x 40 ft., and remodeling the old building. Electric conveyors, baling machines and sorting equipment will be installed at a cost of $12,000.

The Simonds Canada Saw Co., Ltd., Montreal, manufacturer of saws, knives, files, steel, etc., is building a one-story, 70 x 175 ft. addition, to cost about $50,000. It is expected that the building will be completed and the machinery installed within a month.

The Brantford Machine & Tool Co., Ltd., Brantford, Ont., recently incorporated, will take over the plant and business of the Brantford Machine & Tool Co. In addition to the line of machine and machine tool work, it is the intention to manufacture bench presses, boring tools and small air compressors. William J. Ham, a son of Joseph Ham of Ham Brothers, has secured an interest in the company and will take an active part in the business.

The Mami Axle Co., Ltd., St. Stephens, N. B., has recently been reorganized and its capital stock increased from $50,000 to $200,000. The forge shop, destroyed by fire last July, will be rebuilt immediately and will be 60 x 160 ft. A full line of equipment will be installed. The board of directors comprises: President, Charles E. Henstis; vice-president, James Arnold, Brockville; secretary-treasurer, J. A. Briggs; Hon. George P. Graham, Brockville, Ont.; T. J. Dillon and B. J. McCormack both of Welland, Ont.

Contracts have been awarded for the erection of car shops to cost $60,000 for the Niagara, St. Catharines & Toronto Railway, at St. Catharines, Ont.

Clark Brothers, Ltd., Bear River, N. S., is making preparations for the erection of a paper mill at a cost of $500,000, which will be operated in connection with the pulp mill now under construction.

P. L. W. Dupre, 20 St. James Street, Montreal, is receiving bids for the erection of a brass foundry and workshops for G. Dupont.

Westman & Baker, Ltd., 165 Adelaide Street West, Toronto, has been reorganized with a capital stock of $100,000 to take over the plant and business of Westman & Baker, manufacturers of printing machinery and is contemplating installing additional machinery. Walter T. Johnson is president and manager.

The buildings erected by the United States Government at Leaside, Ont., the last year of the war for a munition factory has been sold to the Canada Wire & Cable Co. It is the intention of the new owner to operate them as an addition to its present plant.

California

LOS ANGELES, Oct. 25.

The County Commission, Fresno, Cal., is having plans prepared for a one story machine works and repair shop, to be located on the Fair Grounds. D. M. Barnwell is county clerk.

The United States Refrigeration Co., Los Angeles, has been incorporated with a capital of $200,000 by R. W. Schindler, J. Q. Roscoe and R. T. Linney, to manufacture refrigerating machinery.

The Pacific Lighting Fixture., 1327 South Main Street, Los Angeles, has filed notice of organization to manufacture electric and gas fixtures. William F. Brandes, 3035 West Pico Street, heads the company.

The Pacific Gas & Electric Co., San Francisco, has made application to the State Railroad Commission for permission to issue stock for $5,000,000, the proceeds to be used for hydroelectric power plant construction and development work.

Fire, Oct. 17, destroyed the plant of the Schumacher Wall Board Co., 5802 South San Pedro Street, Los Angeles, manufacturer of wallboard and similar products, with loss estimated at $200,000, including machinery. It will be rebuilt.

The Western States Oil & Refining Co., Santa Ana, Cal., recently incorporated with a captial of $1,000,000 is planning for the erection of a new refinery in the vicinity of Yorba Linda, to cost about $200,000, with machinery. Clyde Bishop, Charles Mueller and L. R. Klatt, Santa Ana, head the company.

The new machine shop to be erected by the Pomona Mfg. Co., Pomona, Cal., manufacturer of iron castings, machinery, etc., will be one story, 82 x 160 ft. An electric traveling crane will be installed.

Lewis & Gray, 156 Main Street, San Francisco, manufacturers of iron specialties, have filed plans for a new one story works on Bryant Street.

The Commercial Motor Co., Los Angeles, has been incorporated with a capital of $200,000 by George Goodrum, A. E. Neff and Frederick S. Slagle, to manufacture automobile motors and parts.

F. M. Johnson & Son, Los Angeles, have filed notice of organization to operate a machine works at 130 North Catalina Street, for parts manufacture and repair work.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per Lb.
Bars:	
Refined iron, base price	5.50c.
Swedish bars, base price	20.00c.
Soft Steel:	
¾ to 1⅞ in., round and square	3.48c. to 4.75c.
1 to 6 in. x ⅜ to 1 in.	3.48c. to 4.75c.
1 to 6 in. x ¼ to 5/16 in.	3.58c. to 4.75c.
Rods—⅝ and 11/16 in.	3.53c. to 5.45c.
Bands—1½ to 6 by 3/16 to No. 8	4.18c. to 7.00c.
Hoops	5.68c. to 7.00c.
Shapes:	
Beams and channels—3 to 15 in.	3.58c. to 4.30c.
Angles:	
3 in. x ¼ in. and larger	3.58c. to 4.30c.
3 in. x 3/16 in. and ⅛ in.	3.83c. to 5.10c.
1½ to 2½ in. x ⅛ in.	3.63c. to 4.90c.
1½ to 2¾ in. x 3/16 in. and thicker	3.58c. to 4.85c.
1 to 1¼ in. x 3/16 in.	3.63c. to 4.90c.
1 to 1¼ in. x ⅛ in.	3.68c. to 4.95c.
⅞ x ⅞ x ⅛ in.	3.73c. to 5.00c.
¾ x ⅛ in.	3.78c. to 5.05c.
⅝ x ⅛ in.	4.18c. to 5.95c.
½ x 3/32 in.	5.28c. to 7.65c.
Tees:	
1 x ⅛ in.	3.98c. to 5.90c.
1¼ in. x 1¼ x 3/16 in.	3.88c. to 5.80c.
1½ to 2½ x 3/16 in. and thicker	3.68c. to 5.60c.
3 in. and larger	3.63c. to 5.30c.

Merchant Steel	Per Lb.
Tire, 1½ x ½ in. and larger	4.75c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	5.35c.
Toe calk, ½ x ⅜ in. and larger	6.00c.
Cold-rolled strip (soft and quarter hard)	12c. to 14c.
Open-hearth spring steel	7.00c. to 10.00c.
Shafting and Screw Stock:	
Rounds	6.25c. to 7.00c.
Squares, flats and hex	6.75c. to 7.50c.
Standard cast steel, base price	15.00c.
Best cast steel	20.00c. to 24.00c.
Extra best cast steel	25.00c. to 30.00c.

Tank Plates—Steel

¼ in. and heavier: 3.78c. to 4.50c.

Sheets

Blue Annealed

	Per Lb.
No. 10	7.00c. to 8.00c.
No. 12	7.05c. to 8.05c.
No. 14	7.10c. to 8.10c.
No. 16	7.20c. to 8.20c.

Box Annealed—Black

	Soft Steel C.R., One Pass Per Lb.	Wood's Refined, Per Lb.
Nos. 18 to 20	8.40c. to 9.30c.	.....
Nos. 22 and 24	8.45c. to 9.35c.	10.80c.
No. 26	8.50c. to 9.40c.	10.85c.
No. 28	8.60c. to 9.50c.	11.00c.
No. 30	8.70c. to 9.75c.	.....

No. 28, 36 in. wide, 10c. higher.

Galvanized

	Per Lb.
No. 14	8.85c. to 10.10c.
No. 16	9.10c. to 10.25c.
Nos. 18 and 20	9.25c. to 10.40c.
Nos. 22 and 24	9.40c. to 10.55c.
No. 26	9.55c. to 10.70c.
No. 27	9.70c. to 10.85c.
No. 28	9.85c. to 11.00c.
No. 30	10.35c. to 11.50c.

No. 28, 36 in. wide, 20c. higher.

Pipe

Standard—Steel	Blk.	Galv.
½ in. Butt	—34	—17
¾-3 in. Butt.	—38	—22
3½-6 in. Lap.	—33	—18
7-12 in. Lap.	—23	— 6

Wrought Iron	Blk.	Galv.
¼-1½ in. Butt.	— 3	+17
2 in. Lap	+ 3	+21
2½-6 in. Lap.	+ 1	+17
7-12 in. Lap.	+12	+30

Steel Wire

Base Price* on No. 9 Gage and Coarser	Per Lb.
Bright basic	8.00c.
Annealed soft	8.00c.
Galvanized annealed	8.75c.
Coppered basic	8.50c.
Tinned soft Bessemer	10.00c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

Base Price	
High brass sheet	25¼c. to 26c.
High brass wire	26¼c. to 27c.
Brass rod	23¼c. to 25c.
Brass tube	41½c. to 43c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 26½c. to 27½c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20
IC	$16.50	$14.25
IX	18.75	16.25
IXX	20.50	18.00
IXXX	22.25	19.75
IXXXX	23.75	21.50

Coke—14x20	Primes	Wasters
80 lb.	$11.80	$11.55
90 lb.	11.90	11.65
100 lb.	12.00	11.75
IC	12.25	12.00
IX	13.25	13.00
IXX	14.25	14.00
IXXX	15.25	15.00
IXXXX	16.25	16.00

Terne Plates

8-lb. Coating 14 x 20

100 lb.	$ 9.35
IC	9.50
IX	10.50
Fire door stock	12.75

Tin

Straits pig	43c.
Bar	50c. to 55c.

Copper

Lake ingot	18c.
Electrolytic	17¾c.
Casting	17½c.

Spelter and Sheet Zinc

Western spelter	9c. to 9¼c.
Sheet zinc, No. 9 base, casks	15c. open 15½c.

Lead and Solder*

American pig lead	8c. to 8¾c.
Bar lead	9c. to 10c.
Solder, ½ and ½ guaranteed	30c.
No. 1 solder	27½c.
Refined solder	23½c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	90c.
Commercial grade, per lb.	50c.

Antimony

Asiatic: 8½c. to 9½c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb. 35c. to 38c.

Old Metals

Business is unsettled, holders not being inclined to sell at present prices and buyers wanting bargains. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	12.00
Copper, heavy and wire	11.00
Copper, light and bottoms	10.00
Brass, heavy	7.75
Brass, light	5.50
Heavy machine composition	12.00
No. 1 yellow brass turnings	7.00
No. 1 red brass or composition turnings	10.00
Lead, heavy	5.50
Lead, tea	3.75
Zinc	4.00